SIEMENS

SIOS

SP

Service Manual

Siemens Integrated OR System **55 37 027**

Beginning with software version
VA 00C

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Document Status

The document corresponds to the status current at the time of device delivery.

The paper copy is an uncontrolled document.

Up-to-date documentation can be ordered from your local Siemens office.

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Abbreviations

AAM	Audio Amplifier Module
AE	Receipt of order
BM / VM	Image mixer / video mixer
CAI	Control Audio Interface
CANopen	Communication bus / control interface for external technologies
C-arm	Mobile X-ray system
CG	Surgical gases
CHARM	Change request management system
CMT	Configuration Management Tool
CO_2	Carbon dioxide
CSE	Customer Service Engineer
CS PS	Internal department code (Customer Services Product Support)
DB	Device Box for housing surgical devices
DE	Documentation unit, upper section of cabinet
DIN	German industry standard
DL catalog	Service provider catalog
DU	Display Unit (central image and control unit)
EN	European standard
Endo	Endoscopy
ES	Electronics cabinet, central SIOS control
ES1 / ES2	230 V multipoint connector
HBT	Hand input device
RF	Radio frequency
HPC board	Name of PC board
IEC	International Electrotechnical Commission
IP	Industry partner
kdb	Knowledge database
Keyboard	Keyboard
LC	Light Control
Mat_No.	Material number (Siemens order number in SAP system - (previously called "Item Number")
Mh	Man hours
Mod	Modality

Modem	Modem
Mouse	Mouse
MPS	Multi Power Supply
OR	Operating room
PET	Product introduction team
PC	Personal Computer
PG	Planning Guide
PI	Pricing Information
PM	Project Manager
PS 12V	12V Power Supply
PSU	Power Supply Unit (main power supply in the electronics cabinet)
RS 232	RS 232 interface distributor (serial interface)
SH	Interface to building technology
SIOS	Siemens Integrated OR System
SIOS PC	SIOS Personal Computer
TFT	Thin Film Transistor
TM	Separation module
USV (**UPS)**	Uninterruptible Power Supply
VCR	Video recorder
VDE	Association for Electrical, Electronic and Information Technologies
VK	Short designation of system cable
VM / BM	Video mixer / image mixer
VP	Video printer
VR P FP	Internal department code
VS	Video Splitter
VR	Video Receiver
VX	Video Multiplexer
WS	Wall column, wall supply unit for Device Box and C-arm system
ZIP	ZIP drive (external)
ZS	Central control, lower section of cabinet

Definitions

Trades	Comprises all crafts and trades involved in completing a project
Worst case	Most unfavorable constellation or situation to be expected
Stand-alone operation	Manual operation of functional modules without SIOS control
IP	Industry partner; manufacturer of functional modules equipped with SIOS interface

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Service

Technical Service is performed exclusively on the integration module and system cables (refer to the system overview). Other measures are available and other service organizations are responsible for all function components.

Clarification of responsibilities by telephone is the prerequisite for performing service work in the OR.

Tools, measurement devices, and auxiliary materials required

NOTICE	**All tools, measurement devices, and auxiliary materials listed can be found in the STC (Service Tools Catalog) except those designated with an asterisk (" * ").**

- Standard tool kit*
- Digital Multimeter (e.g., “Fluke 8060A”, mat. no. 97 02 101)
- Protective conductor meter (e.g., “protective ground wire tester”, Mat. No. 44 15 899)
- One 250 MB ZIP diskette*
- A video cassette in the correct format (VHS for Europe / PAL for USA)*
- Backup diskette* of the affected system (part of the customer system).

Time and Personnel Required

A maximum 2 working hours and one trained technician is required for each service call.

Technical Data

Refer to the Planning Guide (SPR1-130.891.11...), room plan, and individual room configuration for all technical data (system binder).

Required Documentation

Title	Print number	Source
Start-up Instructions	SPR1-130.815.12.	Siemens Med
Installation Instructions	SPR1-130.813.11.	Siemens Med
SIOS Operator Instructions	SPR1-130.	Siemens Med
SIOS Schematic	SPR1-130.844.11	Siemens Med
Spare Parts List	SPR1-130.870.01	Siemens Med
SIOS system binder	n.a.	SIOS component

NOTICE **Technical documentation is available to technicians in PDF format on the SIOS PC.**

The documentation may be selected via menu "Settings", "Service", "Activate service", then enter password 1 at the "SystemParts" task card.

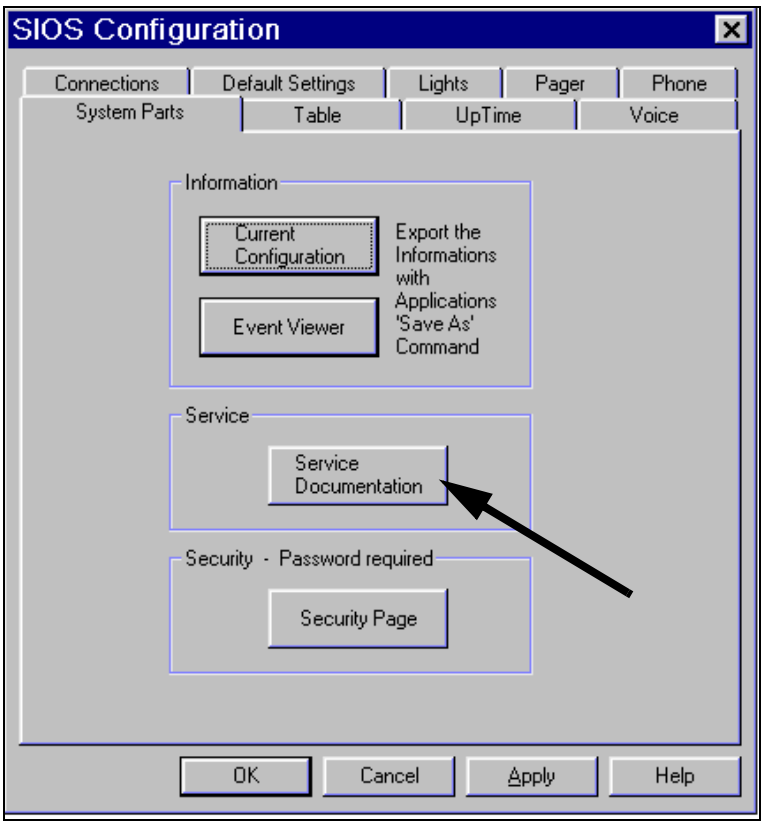

Fig. 1 System Parts task card

Use the "click box" to open the service documentation; move the "SIOS Configuration" window from the center of the monitor.

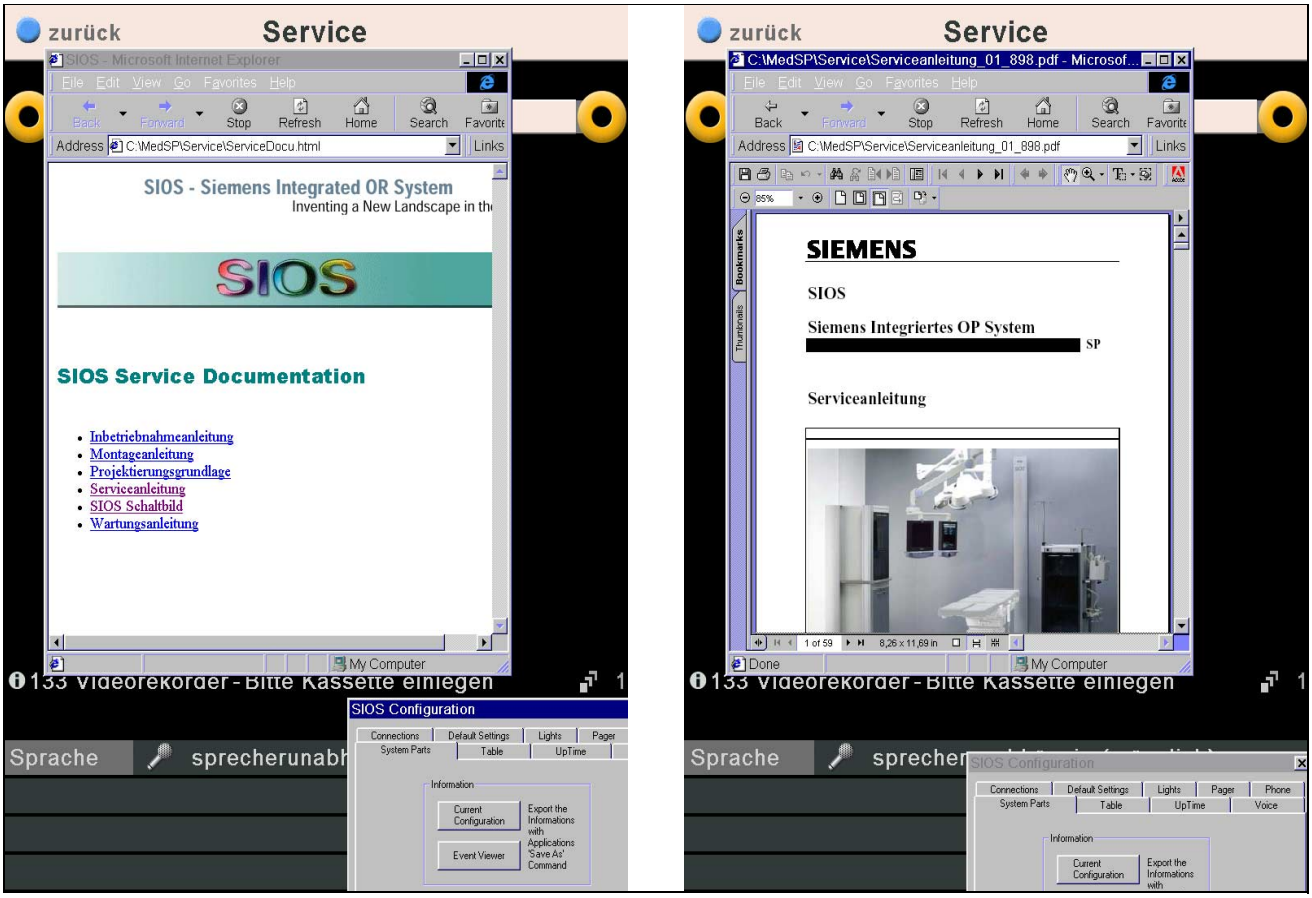

Fig. 2 Documentation overview and PDF selection

Select the document required and open by double-clicking.

Safety information and protective measures

WARNING

Observe safety information!

Non-compliance may result in death, personal injury, or property damage.

When performing procedures and tests, you have to follow:
- **the product-specific safety information in the document,**
- **the safety information in TD00-000.860.01... ,**
- **as well as the general safety information in ARTD Part 2.**

WARNING

Voltage!

Contact with voltage-conducting parts may result in death or serious injuries.

Before replacing components, the SIOS has to be shut down and the main fuse F1 in the electronics cabinet switched off.

Product-specific safety measures

Hygiene and health-related requirements

⚠WARNING

Contamination of the entire OR environment with infectious substances!

Risk of personal infection or transfer of contaminated material to unsecured areas outside the OR.

Face masks are required inside the OR. In addition, all work has to be performed wearing disposable gloves.
Even minor injuries have to be treated and sterilized.
At a minimum, all objects removed from the OR area have to be wiped with a disinfectant.

Material Lockdown

All required materials have to be transferred to the OR area in compliance with customer-specific hygiene guidelines. As a minimum requirement, the containers used (tool boxes and transport cases, boxes of materials, etc.) have to be cleaned with disinfectant prior to being transferred.

Cleaning

Cleaners for system components have to be approved for use inside the OR area.

All cleaning materials (cloths, brushes, etc.) may be used only once per system and have to be disposed of as non-sterile OR waste. If work is performed in the vicinity of an OR area currently in use, all personal and environmental safety requirements have to be observed.

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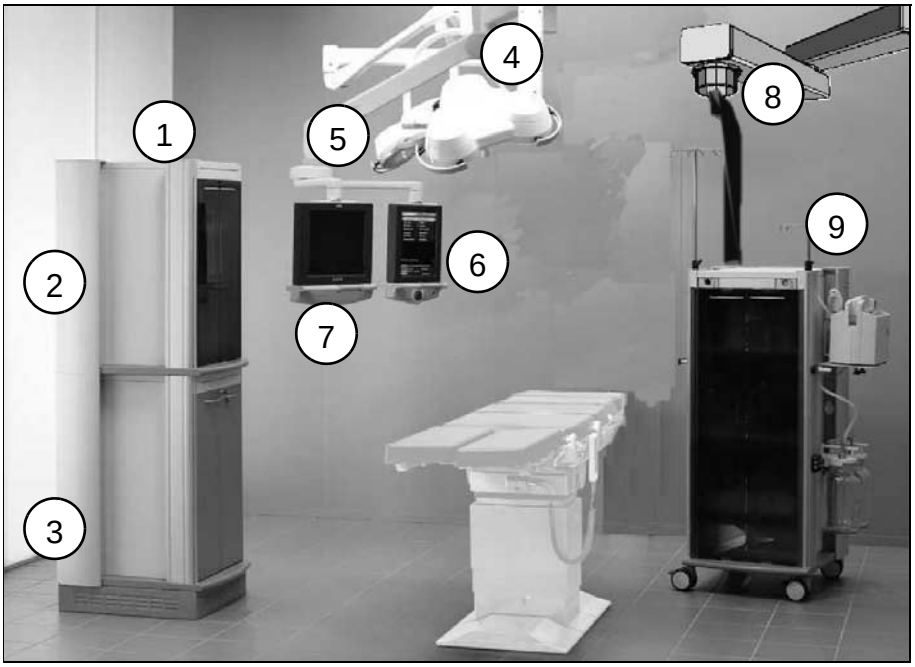

Fig. 1 System overview

Position	Abbrev.	Description
1	ES	Electronics cabinet
2	DE	Documentation unit - upper section of cabinet, incl. video components, mouse, and keyboard
3	ZS	Central control unit - lower section of cabinet, incl. SIOS_PC, integration modules, X-ray C-arm interface
4	DU	Ceiling support, display unit
5	MTS	Monitor support system
6	15" TFT	Menu monitor, operation
7	18" TFT	Image monitor
8	CL	Ceiling-mounted supply arm for device box
9	DB	Device box - accommodates surgical devices, media supply, ultrasound unit interface

SIOS functionality is achieved using integration and functional modules. This document covers the integration aspect only (SIOS delivery volume by Siemens). The functional aspects are provided by external vendors; related information should be obtained from the respective system documentation.

NOTICE

All functional modules provided by other vendors have to be available as specified in the OR equipment order before installation begins.

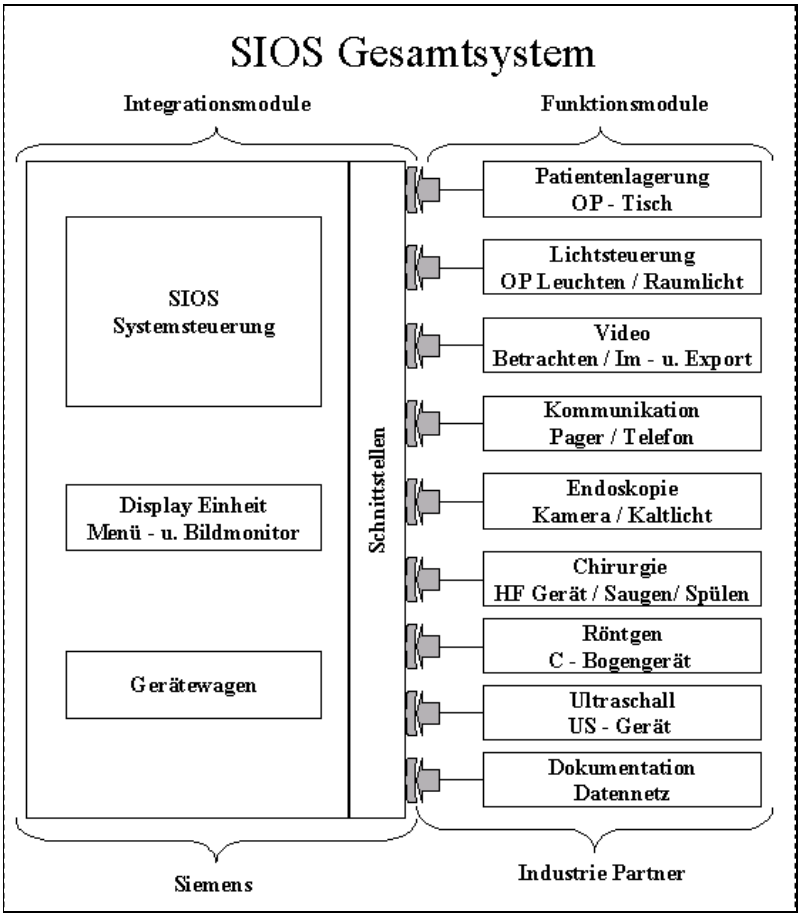

Fig. 2 Overall system

Integration modules		
Electronics cabinet incl. internal cabling	Speaker	Device box incl. internal cabling
SIOS power supply 230 V (PSU) and UPS	System cables VK 2 / VK 3 / VK 5.1	Headset and hand input device (HBT)
SIOS PC; mouse & keyboard; external ZIP drive	CAN branch 1	CAN branch 2 and 12 V power supply 2
RS 232 distributor		Separation module
CAI and modem		
Light control unit		Support arm 1 & MTS 1
MPS & 12 V power supply 1		Control monitor TFT 15”
Image mixer (video mixer)		Image monitor TFT 18”
Integration options		

Support arm 2 & MTS 2	2nd Control monitor TFT 15”	2nd Multi Power Supply
System cable VK5.2	2nd - 4th Image monitor TFT 18”	

Component positions inside the documentation unit

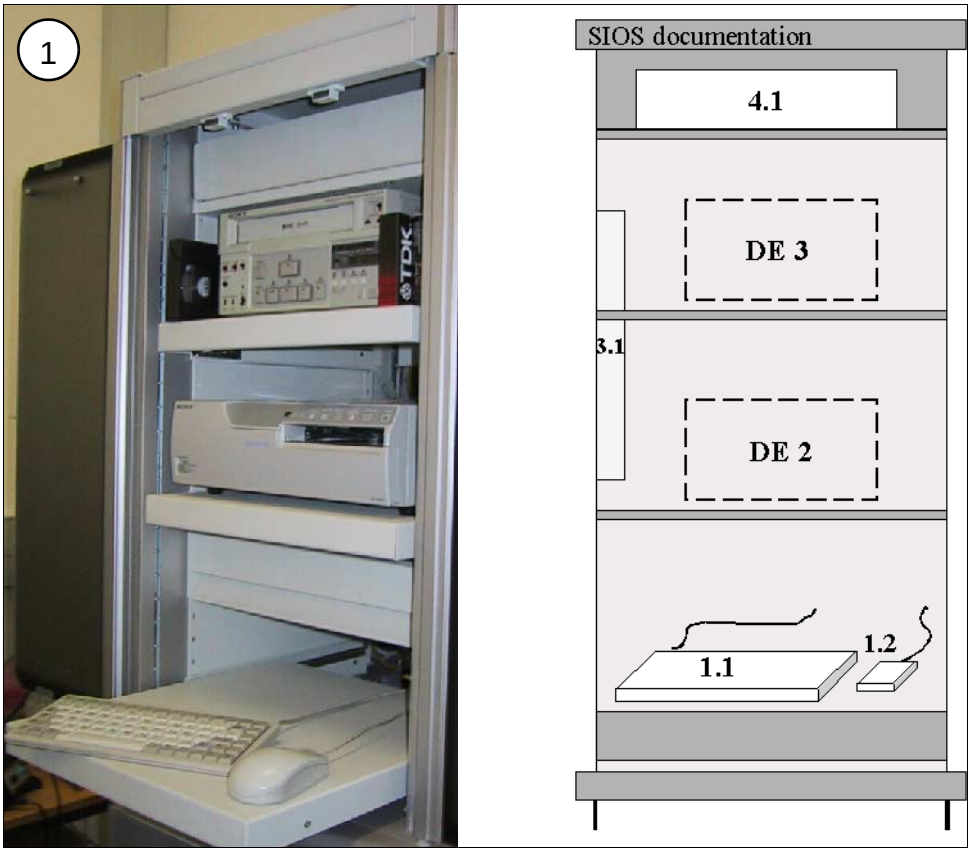

Fig. 3 Component positions inside the documentation unit

Position	Component
1	Cabinet, upper section
1.1	Keyboard
1.2	PC mouse
DE 2	Installation slot for documentation unit *1 (preferably video printer)
DE 3	Installation slot for documentation unit *1 (preferably video recorder)
3.1	ES 2 / multipoint connector 230V
4.1	Light control

*1 = components are provided by user (functional modules). If components are not available for installation, only the cables will be installed.

Component positions inside the central control unit

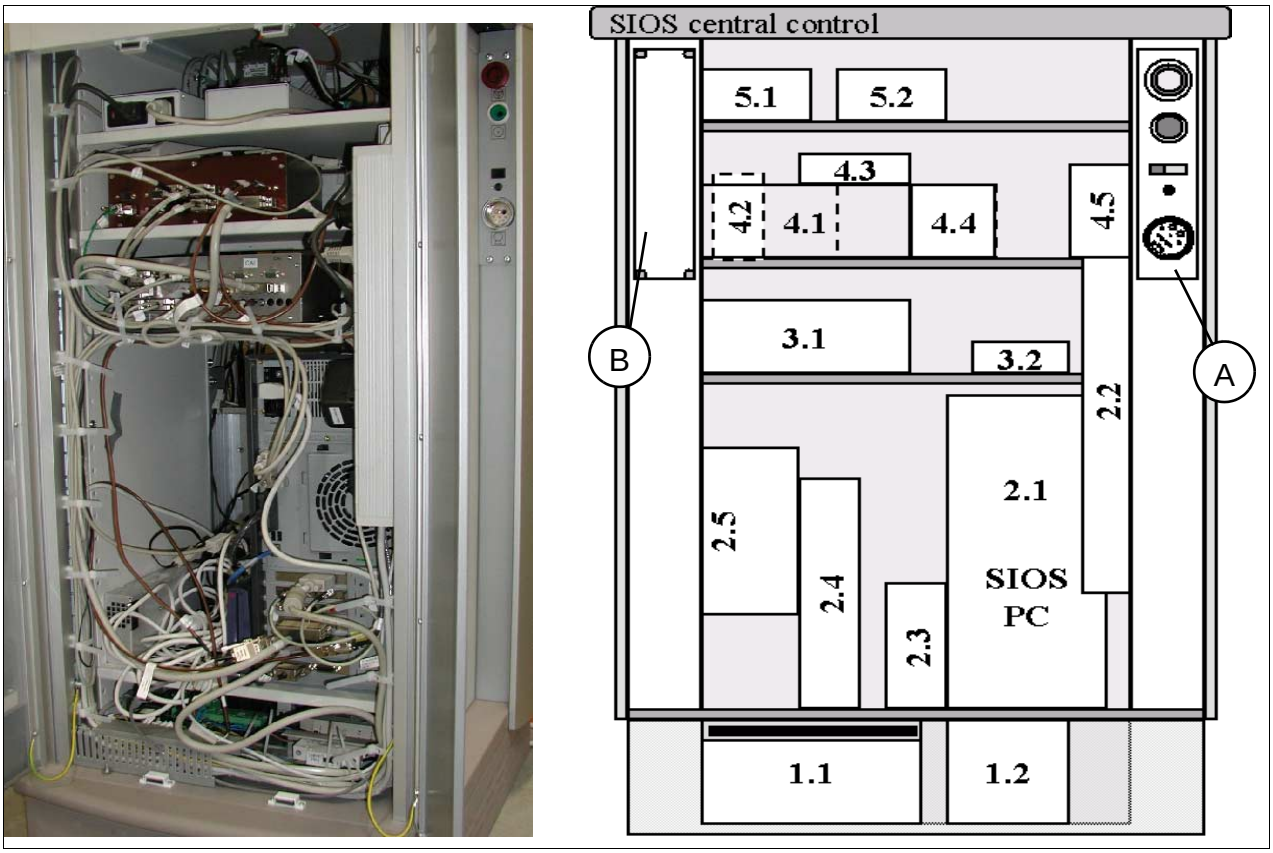

Fig. 4 Component positions inside the central control unit

Position	Component	Position	Component
A	On/off module, right-side installation	3.1	RS232 distributor
B	Bezel cover for on/off module, right or left	3.2	AAM audio amplifier
1.1	PSU / power supply 230V	4.1	CAI Audio Interface
1.2	UPS	4.2	PS 12V power supply
2.1	SIOS PC	4.3	Modem
2.2	ES1 / multipoint connector 230V	4.4	Video buffer amplifier
2.3	ZIP / external drive	4.5	VS 1/ video splitter, menu monitor
2.4	VM / image mixer	5.1	VX / video multiplexer, image monitor
2.5	MPS / Multi power supply	5.2	VR/ video receiver, image monitor

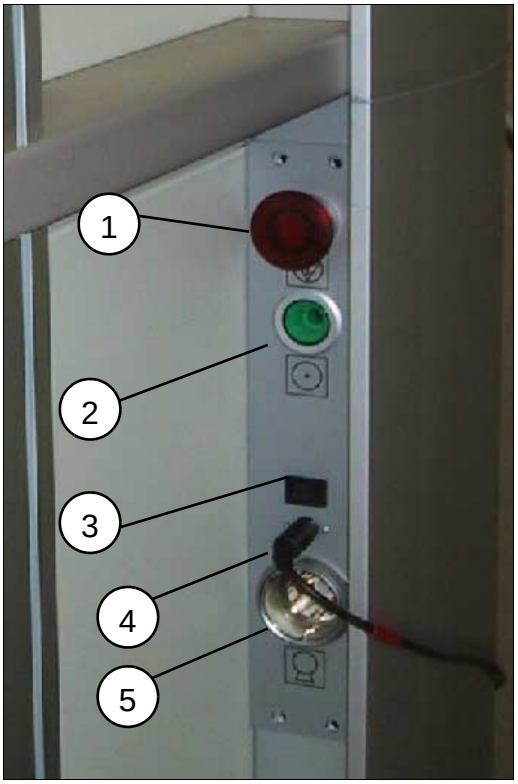

Fig. 5 On/off module inside the central control unit

Position	Component
1	EMERGENCY OFF switch
2	SIOS on/off switch
3	On/off video out
4	Video out interface
5	X-ray C-arm interface

SIOS PC connections

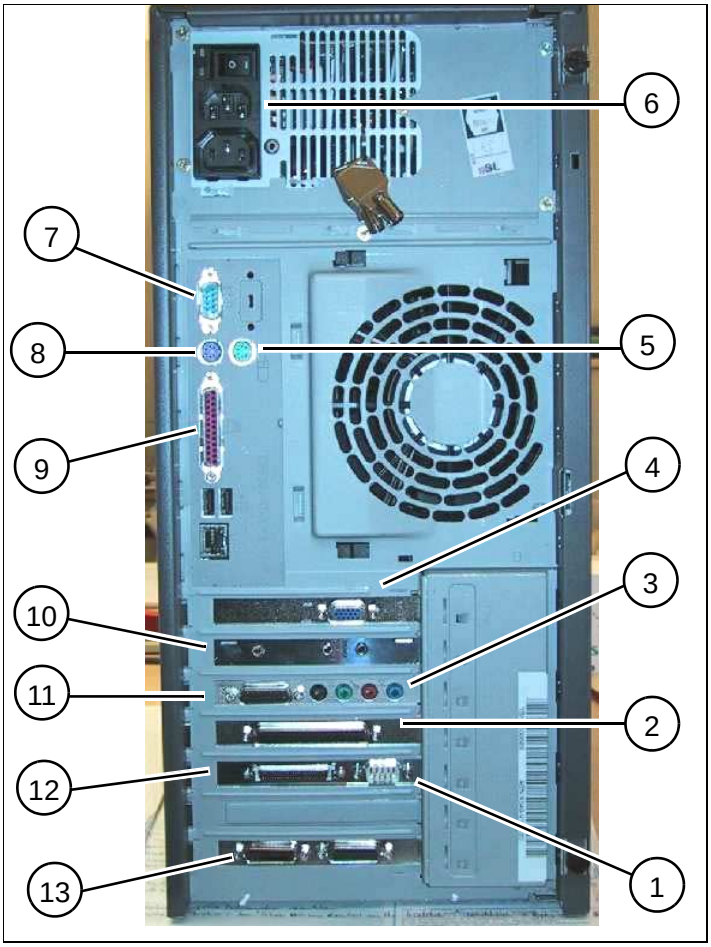

Fig. 6 PC connections

Pos.	Description	Pos.	Description
1	CANTRANS	8	Keyboard
2	Serial interface (Moxa board)	9	ZIP drive (external)
3	Speaker (HPC board)	10	Line in (HPC)
4	VGA Monitor	11	Line out
5	Mouse	12	Janz board
6	230 V line voltage	13	Sound (hand input device)
7	COM1/ Modem		

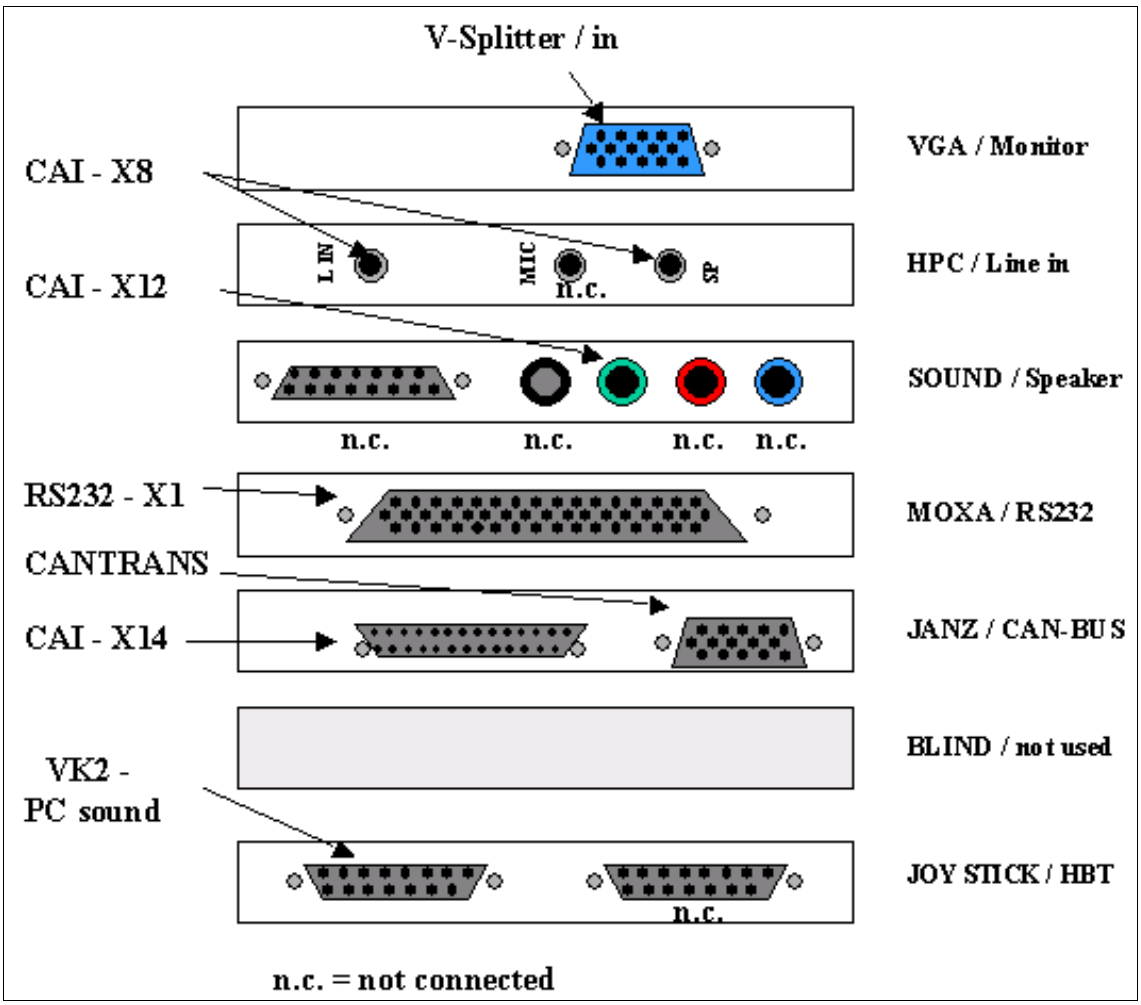

Fig. 7 PC connection - details

Component positions inside the device box

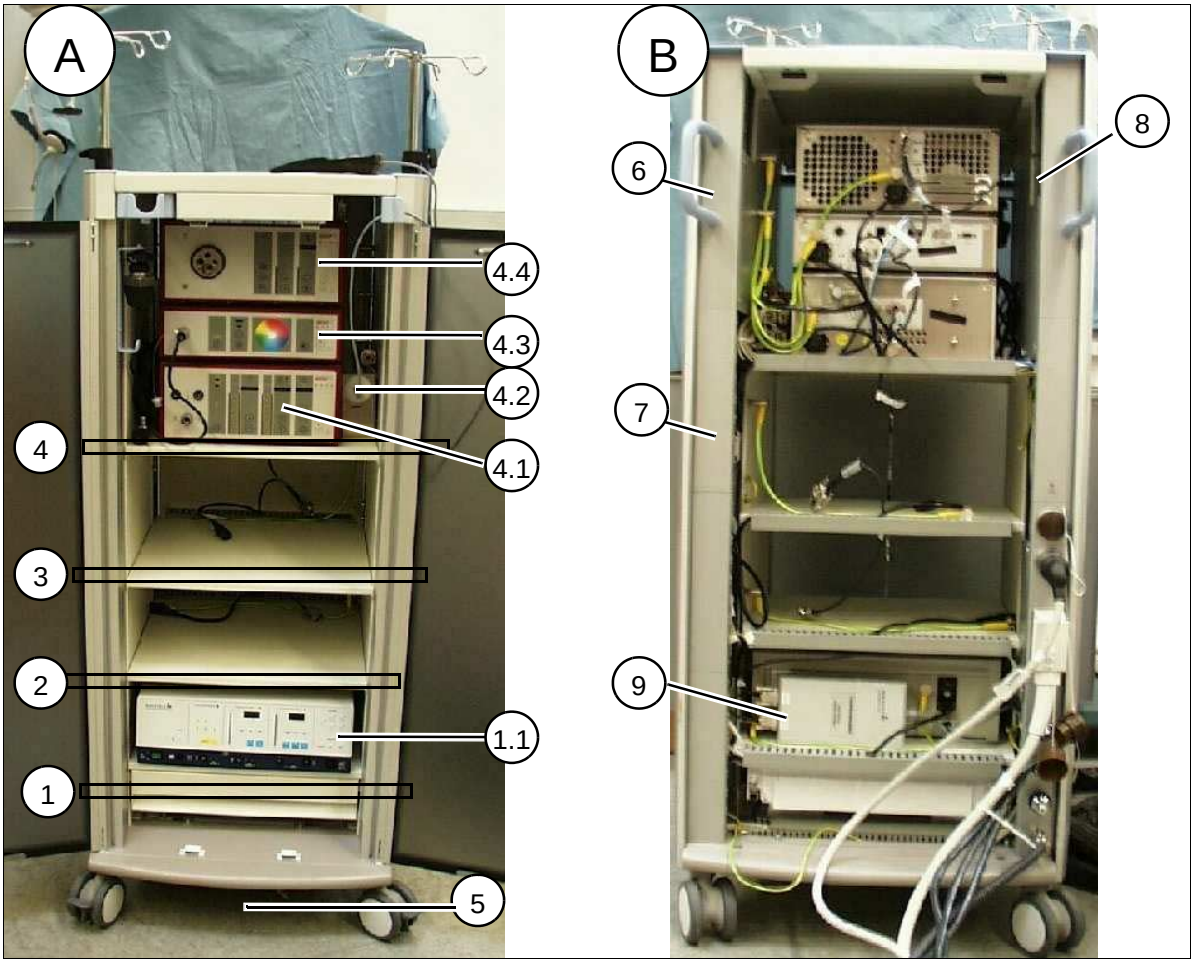

Fig. 8 Component positions inside the device box

Pos.	Description	Pos.	Description
A	DB, front view	4.2	Separation module for HBT
B	DB, rear view	4.3*	Endo camera
1	Lower mounting plate with drawer / Level 1	4.4*	Preferred location for cold light device (heat dissipation)
1.1*	Preferred location for RF device	5	IR booster (mounted below base plate, front transmit direction)
2	2nd Mounting plate / Level 2	6**	Power Supply 12 V
3	3rd Mounting plate / Level 3	7**	Multipoint connector 230 V
4	4th Mounting plate / Level 4 - preferred location for endo devices	8**	CAN branch
4.1*	Insufflator	9*	Preferred location for CAN adapter

* Not included in SIOS Siemens delivery volume / ** Installed in design profile

Device box - functional components

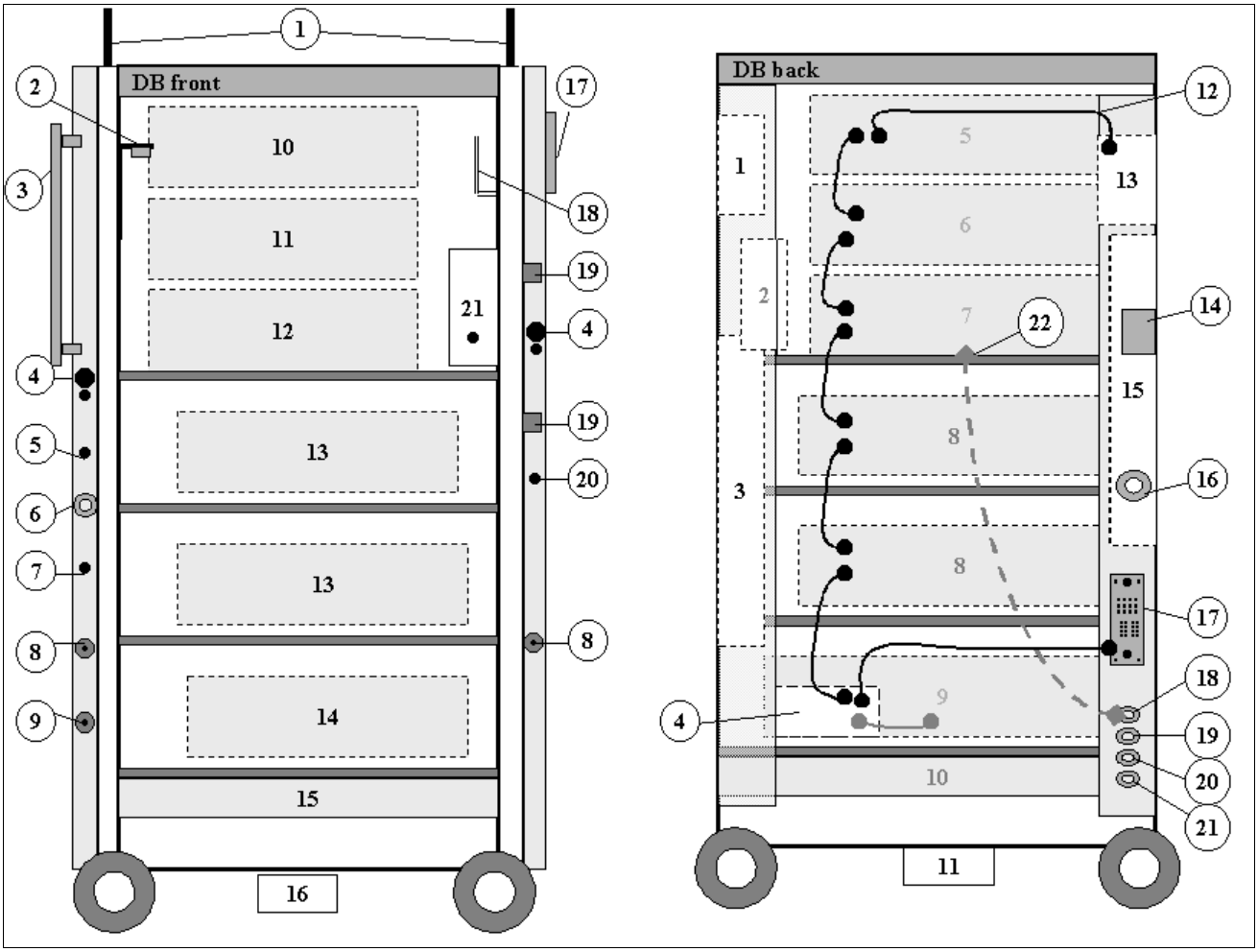

Fig. 9 Device box - functional components

DB Front	Description	Note
1	IV holder	One each on the front right and left side
2	Camera head holder	Mechanical park position for camera head
3	Perfusor holder	Anesthesia support
4	230V(110V)/150W	Line supply connection incl. circuit breaker
5	Headset connection	Connection for cable voice control
6	Video, ultrasound device	Image transmission from US device
7	Footswitch	n.c. (preparation for options)
8	Vacuum	Connection to sterile field

9	Air motor	Connection to sterile field
10	Endo cold light	Maximum heat build-up, therefore always top position
11	Endo camera	Proximity to endo light; control cable connection
12	Insufflation device	
13	Surgical equipment	Free space (e.g., rotary pump)
14	RF device	Source of RF interference, therefore always bottom position
15	Instrument drawer	Storage space for user
16	Infrared booster	OR table control; sub-flooring installation
17	HBT holder	Park position for non-sterile hand input device
18	Cable routing	Mechanical bracket
19	Standard rail	Accommodates devices (e.g., collection containers); right or left-side installation
20	CAN bus connection	Connection for SIOS-compatible devices (e.g., ultrasound)
21	Separation module	4kV separation; socket for hand input device

DB Back	**Description**	**Note**
1	Power supply 12V	Installed in design profile
2	Separation module	Back side, internal connections
3 & 15	Multipoint connector right / left	Power supply for surgical devices; installed in design profile
4	Adapter CAN-RS232	Provided by OEM
5 to 9	Back side of devices	see DB Front
10	Instrument drawer	n/a
11	Infrared booster	OR table control; sub-flooring installation
12	CAN cables	Serial from 17 to 13
13	CAN branch 2	Always CAN cable routing termination
14	Cable holder	Strain relief for VK1/VK3 from ceiling support arm
16	Video connector VK1	Video connection Endo to ES
17	System connector	Line voltage and signal connection to ES
18	CO2 in	Central supply for insufflation from VK3

19	Vacuum	Central supply from VK3
20	Compressed air in	Air motor in from VK3
21	Air motor out	Central exhaust from VK3
22	CO2 adapter	OEM-specific connection

Supply to device box

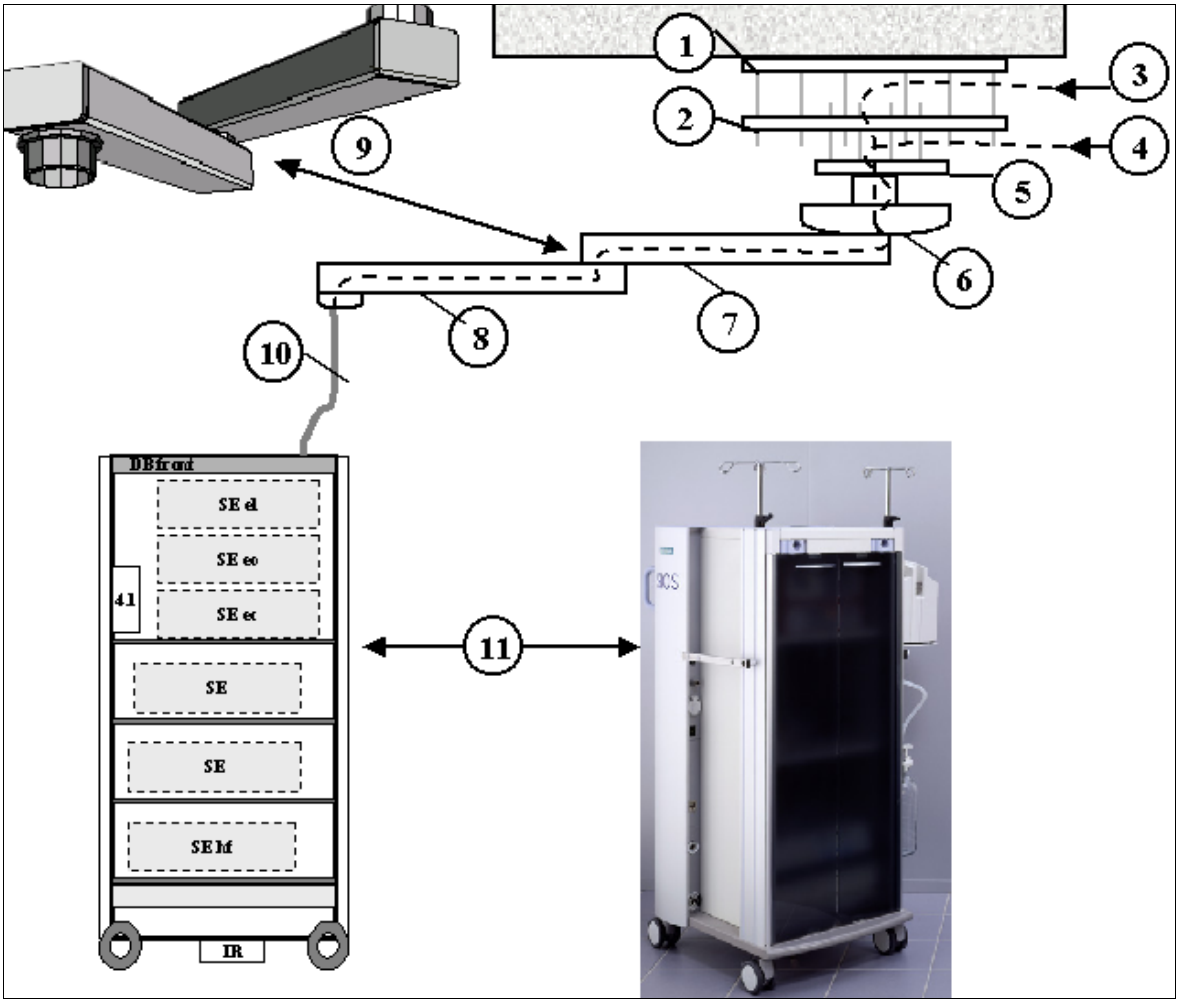

Fig. 10 Ceiling-mounted supply arm for device box

No.	Description	Note
1	Anchor plate	Unfinished ceiling installation
2	Interface plate	Alternatively single or tandem
3	Gas interface	On-site installation
4	System cable interface	VK 1 & VK3 to electronics cabinet
5	Flange	Ondascope support arm system

6	Single canopy	Does not apply for tandem connection
7	Cantilever arm 1	Length 800 or 1000
8	Cantilever arm 2	Length 800 or 1200
9	Dual cantilever arm	Diagram
10	Cables and gas hose	Supply lines to the device box
11	Device box	

Component positions in the monitor unit

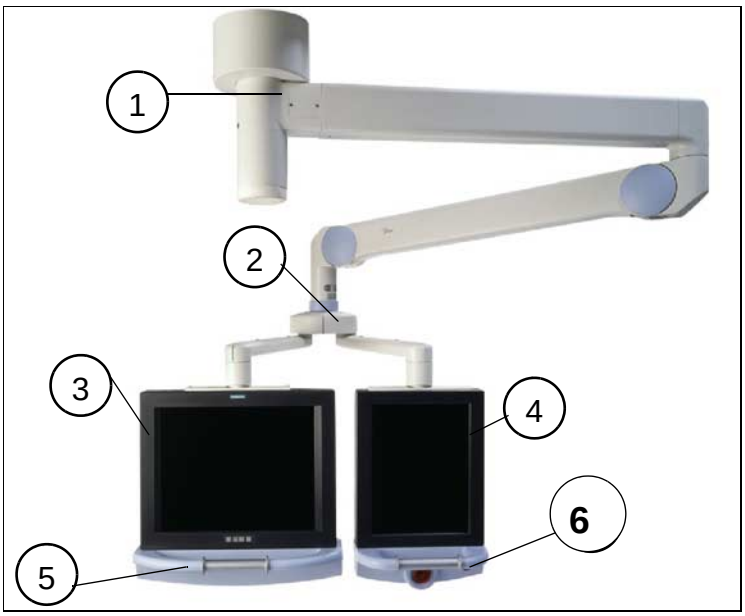

Fig. 11 Component positions in the monitor unit

Position	Description	
1	Support arm system	Onda Space
2	Monitor support system	
3	TFT Monitor 18"	
4	TFT Monitor 15"	
5	Grip module 18"	
6	Grip module 15"	Emergency Stop and Radiation On indicator

Hand input device (HBT)

Fig. 12 Hand input device

- Upper button (blue) for "Menu Back" function.
- Right and left buttons (yellow) for "Selection Menu Item" at menu monitor.
- Arrow buttons (white) for "Selection Menu" / up or down at menu monitor.
- Lower button (white) for "Start Printing" function (video printer - no menu display at monitor).

Keyboard

The dark-colored function keys are labeled with the same international symbols on all keyboards. The light-colored "Editor keys" are labeled in the respective national language.

Fig. 13 Keyboard

The language ID on the model plate is indicated by the two letters following the article no.

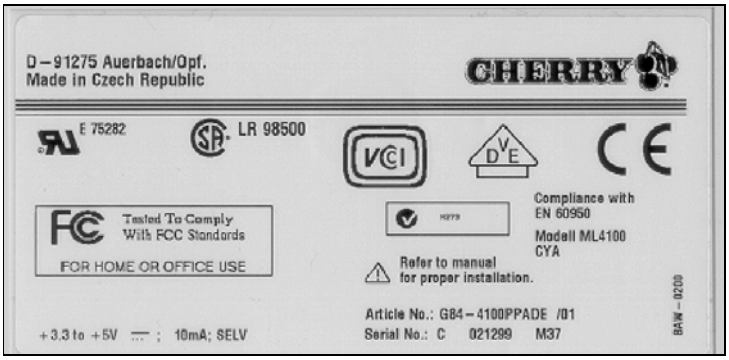

Fig. 14 Model plate (bottom side of keyboard)

Country ID		**Material no.**
Germany	DE	3080900
Switzerland	CH	3080926
United Kingdom	EN	3080942
Spain	ES	3080934
Italy	IT	3080959
Norway	NO	3080967
Finland	SF	3080975
Belgium	BE	3080918

Modem

Country-specific modems always include a power supply, phone cable, and PC interface cable.

Country ID		Material no.
Germany	DE	3076940
Austria	ÖST	3082732
Switzerland	CH	3082724
The Netherlands	NL	3082658
Luxembourg	LX	3082674
Belgium	BE	3082641
United Kingdom	GB	3076965
Sweden	SW	3082690
Norway	NOR	3082682
Spain	ES	3082666
Italy	IT	308270

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Symbols

The following information is displayed at the menu monitor with a leading symbol, a numerical display, and a text line as follows:

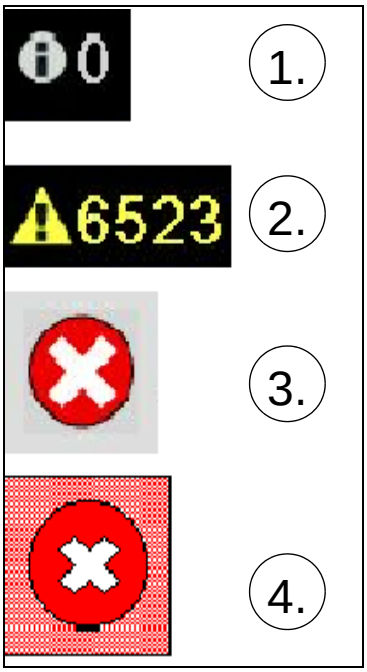

Fig. 1 Info - Symbols

1. "i" for Information: a status or an event.
2. "!" for Warning: missing or limited availability of a function that could result in an error.
3. "X" with gray background for error: indicates malfunction / defective components or devices.
4. "X" with red background for fatal error: ignoring this error may be hazardous to the patient, operating personnel, or the system.

The messages refer both to the integration module and the functional module.

Monitor Display

Examples of information, warnings, and errors in the information section of the menu monitor.

Fig. 2 Menu monitor info and status line

NOTICE	**At times, the text displayed in the line "events that have occurred" may be incomplete.**

Refer to the example above for error 3040: Complete Text - no connection! ir - devices cannot be operated.

The complete text is displayed when the event occurs (refer to the example for error message).

All messages are stored in the "Error_log_file". Personnel at the appropriate service level have the authorization to read log files. Refer to the "Log Files" chapter for the corresponding procedure.

Example: Error Message

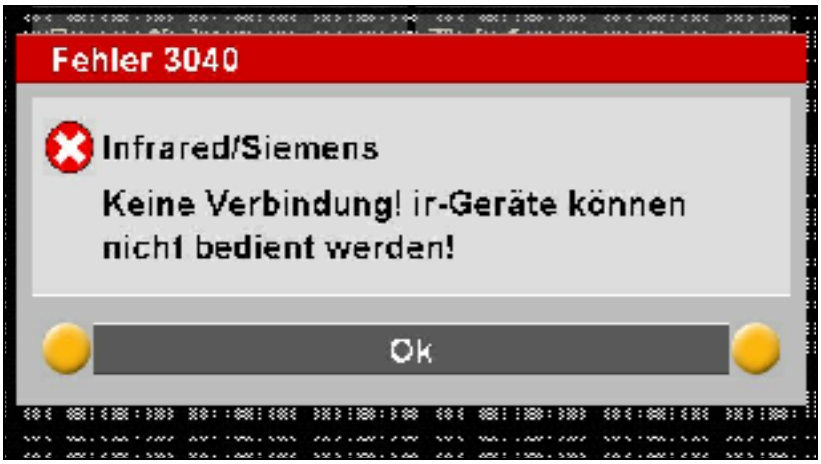

Fig. 3 Error message at menu monitor

The monitor section containing the menus behind the "error window" is covered in gray.

Example: Fatal Error

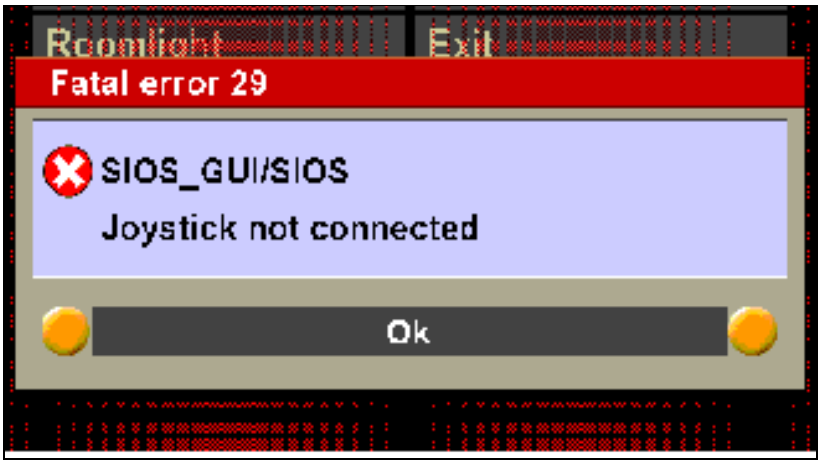

Fig. 4 Error message at menu monitor

The monitor section containing the menus behind the "error window" is covered in red.

List of System Messages

Symbol	DE	EN
I	Information	Information
W	Warnung	Warning
E	Fehler	Error
F	Fataler Fehler	Fatal Error
( )	Quelle des Fehlers	Source of Information

Infrared Booster via RS232

	No.	Infrarot (OP Tisch)	Infrared (OR table)
E	3040	Keine Verbindung! ir-Geräte können nicht bedient werden!	No connection! Unable to handle ir-devices!
i	3041	Verbindung aufgebaut	Connection established
E	3042	Fehlerhafte Konfiguration (COMQuelle)! ir-Geräte können nicht bedient werden!!	Error in configuration (COM source)! Unable to handle IR devices!

CANopen Bus

	No.	(CAN-Gerät) z.B. Endokamera	(CAN device) e.g. endocamera
W	1034	2 identische Geräte werden nicht unterstützt! Das 2. "(Quelle)" wird ignoriert!	You can´t connect two identical devices! Second "(source)" will be ignored!
E	4003	Keine Verbindung zum can-bus. can-Gerätenicht erreichbar!	Can´t access the can-bus. Unable to access can devices
W	4048	(Quelle) meldet einen Fehler im Selbsttest!	(source) reports a non-fatal error in self test!
W	4049	(Quelle) meldet einen Fatalen Fehler im Selbsttest!! Das Gerät wird nicht gestartet!	(source) reports a fatal error in self test! Device will not be launched!
W	4082	(Quelle) Gerät antwortet nicht! Es wird abgemeldet	Device didn´t respond to a command and will be disconnected!
E	4141	Lizenz für Gerät "(Quelle)" fehlt. Das Gerät wird ignoriert!	Device "(source)" has no license. Device will be ignored!
E	4142	Lizenz für Gerät "(Quelle)" fehlt in der Datenbasis. Das Gerät wird ignoriert!	Device "(source)" is not in license database. Device will be ignored!
E	4144	Gerät "(Quelle)" wird ignoriert! Die maximale Anzahl dieses Typs ist überschritten.	Device "(source)" will be ignored! You have reached the maximum number of connected devices for that component type.

Video Mixer (RS232)

	No.	Video Mixer / Image Mixer	Video Mixer
E	5011	Fehler am COM Port (Quelle). Videomixer ist nicht bedienbar!	Unable to open COM port (source). There will be no videomixer!
i	5020	Verbindung zum Videomixer aufgebaut.	Connection established to video mixer.
E	5021	Keine Verbindung zum Videomixer. Videoquellen sind nicht umschaltbar!	No connection to videomixer. Unable to switch the video sources!
E	5032		Error in the configuration of the video mixer. Unable to switch the video sources!

Digital Out

	No.	Digital Output	Digital Output
E	6031	Digitaler Ausgang nicht verfügbar. Fuß- und Audioumschaltung sind deaktiviert!	Digital output not available. Deactivating foot and audio switch!

Digital In

	No.	Digital Input	Digital Input
E	6130	Digitaler Eingang nicht verfügbar. Fußschalter ist deaktiviert!	Digital input not available. Deactivating foot switch!
W	6131	Verbindung abgebaut!	Lost connection!
E	6132	Notstop gedrückt.	Emergency stop activated.

Video Recorder

	No.	Video Recorder	Video Recorder
i	6320	Verbindung aufgebaut	Connection established
W	6321	Verbindung abgebaut!	Lost connection!
W	6322	Fehler am COM Port für Videorecorder!	Unable to open the COM port for the video recorder!
W	6330	Videorecorder kann zur Zeit nicht "(Quelle)" !	Video recorder can´t "(source)" at this time!
W	6335	Die Tasten am Videorecorder sind nicht aktivierbar! VTR kann nicht bedient werden!	Unable to enable the keys on the video recorder! VTR cannnot be controlled locally!
W	6336	Die Tasten am Videorecorder sind nicht deaktivierbar!	Unable to disable the keys on the video recorder!
i	6337	Kassette ausgeworfen.	Cassette has been ejected.
E	6340	Videorecorder ist im Fehler Status! Recorder rücksetzen...	Video recorder is in error state! Reset recorder...
i	6341	Kein Band!	No tape!
i	6342	Band eingelegt.	Tape inserted.
i	6343	schreibgeschütztes Band!	Write-protected tape!
i	6344	Band ist beschreibbar.	Tape is writeable.
W	6345	Band ist locker!	Tape is slack!
i	6346	Band ist ok.	Tape is not slack.
i	6353	Aufnahme gestartet...	Start recording...
W	6354	Vorsicht! Nur 1/10 vom Band ist noch verfügbar!	Attention: only 1/10 of tape left!
W	6355	Bandende erreicht. Aufnahme gestoppt!	Detected end of tape. Recording stopped!
i	6356	Aufnahme gestoppt	Recording stopped
i	6357	Aufnahme stoppen	Please stop recording

Video Printer

	No.	Video Printer	Video Printer
i	6411	Drucken!	Printing!
i	6420	Verbindung aufgebaut	Connection established
W	6421	Verbindung abgebaut!	Lost connection!
W	6424	Fehler beim Drucken!	An error occured during printing!
i	6425	Drucken fertig.	Printing complete.
i	6426	Band erlaubt (Quelle) Ausdrucke.	Ribbon allows (source) printouts.
W	6428	Keine Verbindung!	No connection!
W	6429	Illegale Quelle "(Quelle)"!	Illegal source "(source)"!
i	6430	Drucken nicht möglich: Papierstau!	Unable to print: Paper jam!
i	6431	Drucken nicht möglich: Keine Band Kassette!	Unable to print: No ribbon cartridge!
i	6432	Drucken nicht möglich: Kein Papier!	Unable to print: No paper!
i	6433	Drucken nicht möglich: Bandende erreicht!	Unable to print: End of ribbon detected!
i	6434	Drucken nicht möglich: Falsches Papier!	Unable to print: Ribbon-paper mismatch!
i	6435	Drucken nicht möglich: Bandfehler !	Unable to print: Ribbon error!
i	6436	Drucken nicht möglich: Top cover ist offen!	Unable to print: Top cover is open!
i	6437	Drucken nicht möglich: Papierstau an der Ausgabe!	Unable to print: Paper jam at paper outlet!
i	6438	Drucken nicht möglich Unbekannter Druckerfehler!	Unable to print: Unknown printer error!
W	6456	Drucke! Bitte warten...	Printing in progress! Please wait...
W	6470	Drucken nicht möglich: Kein Eingangssignal!	Unable to print: No input signal!
W	6471	Drucken nicht möglich: Eingangssignal paßt nicht!	Unable to print: Input signal mismatch!

UPS

	No.	USV	UPS
W	6510	Fehler beim Verbindungsaufbau zur UPS am COM Port (Quelle)!	Unable to establish connection to UPS at port (source)!
E	6512	UPS ist verbunden; aber keine korrekte Rückmeldung. Eine Ausfallwarnung kann ausbleiben!	UPS is connected, but didn´t respond correctly. Probably no blackout-warning!
E	6520	Stromausfall ! SIOS läuft über Batterie!	Blackout! SIOS is running on battery!
i	6521	Netz verfügbar. Runterfahren angehalten.	Main supply restored. Shutdown stopped.
i	6522	SIOS ist noch an Batterie! Shutdown Anfrage ...	SIOS is still on battery! Requesting shutdown...
W	6523	Keine Verbindung zur UPS!	Lost connection to UPS. There will be no blackout warning!
i	6524	Verbindung zur UPS wieder hergestellt.	Restored connection to UPS
i	6525	Runterfahren in (XX) Minuten!	Shutdown in (XX) minutes!
i	6526	Shutdown in einer Minute!	Shutdown in one minute!

Telephone / Pager

	No.	Kommunikation	Communication
i	1	Anruf liegt vor	Incoming call detected
i	2	Anruf angenommen	Incoming call accepted
W	3	Anrufannahme nicht möglich	Incoming call cannot be accepted
i	4	Anruf beendet	Phone call terminated
i	5	Verbindung wurde getrennt	Phone call disconnected
i	6	Pageranwahl gestartet...	Pager call started...
i	7	Pagernachricht gesendet	Pager message sent
W	8	Pageranwahl abgebrochen	Pager call canceled
E	9	Keine Verbindung zu Modem	No connection to modem
F	10	Unerwarteter interner Fehler	Unexpected internal error
i	13	Anruf: Verbindung aufgebaut	Phone call: connection established
W	14	Anruf fehlgeschlagen	Phone call failed
i	15	Anruf: Nummer wird gewählt ...	Phone call: dialing ...
i	16	Anrufbeantworter läuft ...	Auto answering call ...

Menu Monitor

	No.	Graphik (GUI)	GUI (graphical user interface)
i	11	SIOS bereit	SIOS ready
i	12	Tastatur und Maus sind notwendig	Keyboard and Mouse are required !
F	23	SIOS-interne Kommunikation gestört. Zur Fehlerbehebung wird SIOS neu gestartet.	Internal communication failed. Trying to recover. This may take some time.
F	24	SIOS-interne Kommunikation gestört. Fehlerbehebung wird durchgeführt. Dies kann längere Zeit dauern.	Internal communication failed. In order to recover, system will be restarted.
F	25	Folgende Komponenten konnten nicht korrekt gestartet werden:(Quelle). Das System arbeitet voraussichtlich nicht fehlerfrei.	Startup of the following components failed:(source). The system may not work properly.
F	26	Unerwarteter interner Fehler	Unexpected internal error
F	27	Kein Hauptspeicher mehr verfügbar	Out of memory
F	28	Bedienoberfläche ist gestört	Display has been corrupted
F	29	Handbedienteil nicht angeschlossen	Hand input device not connected
F	33	Werteanzeige inkorrekt. Ein Wert im Statusbereich oder in einer der Funktionsanzeigen konnte nicht aktualisiert werden. Der am UI angezeigte Werte kann deshalb vom Gerätewert abweichen.	Value corruption detected. A value in the status bar or in one of the function views could not be updated correctly. Thus the value displayed in the UI may differ from the value displayed by the device.
F	34	Unerlaubte Handbedienteil-Eingabe. Eine oder mehrere Tasten des Handbedienteils wurden gedrückt, obwohl dies zu diesem Zeitpunkt nicht erlaubt ist. Bitte alle Tasten loslassen. Verschwindet der Fehler dennoch nicht, so muß das Handbedienteil ausgetauscht werden.	Invalid hand input device entry. One or more buttons were pressed at a time when no input is allowed. Release all buttons. If the error does not disappear device must be replaced.

Voice Control

	No.	SIOS_VOI	Voice control
i	0	Sprachbedienung gestartet!	Voice Control started!
E	1	Start Sprachbed. fehlgeschlagen!	Voice Control not started!
i	2	Sprachbedienung nicht verfügbar!	Voice Control not available!
i	5	Neuer Sprecher angewählt!	New Voice Control User set!
E	6	Neuer Sprecher nicht angewählt! Mit Voice Training Center testen!	New Voice Control User not set!
i	7	Sprachbedienung deaktiviert.	Voice Control deactivated!
i	8	Sprachbedienung aktiviert!	Voice Control set active!
i	9	Sprachbedienung passiv!	Voice Control set passive!
i	10	Sprachbedienung wird gestartet!	Voice Control Startup in Progress!
i	11	Standardsprecher angewählt!	Default User male set (speaker independent)!
i	13	Neuer Sprecher wird ausgewählt!	Setting new user!
E	15	Vokabularfehler!	Vocabulary error!
W	16	Kommando nicht bearbeitet!	SIOS Command lost!
W	17	Sprecherdaten nicht geladen!!	Speaker data not loaded!
W	18	Statusanzeige fehlerhaft!	Wrong status displayed!
W	19	Sprechername falsch!	Wrong user name displayed!!
W	20	Sprachkommando verloren!	Voice command lost!

The following diagrams specify interfaces in order to delineate sources of error, and to assist in determining who should perform the corrective actions.

Actions in the closed rectangles are generally performed by the user (OR personnel).

Actions in dashed rectangles are generally performed by technically trained personnel (in-house technicians / 3rd party partners).

Actions in rectangles underlined by gray are performed by the responsible service organization (Siemens CSE / IP - CSE / 3rd party partner).

- Page 1.1 / Problem :
  Clarification of responsibilities for each service organization.
- Page 1.2 / Complete system :
  Delimits source of error and clarifies possible actions by in-house OR personnel.
- Page 1.3 / Function group :
  Possible actions by trained in-house technicians.
- Page 1.4 and 1.5 / single module :
  Preliminary clarification of required spare parts - service call by Siemens CSE.

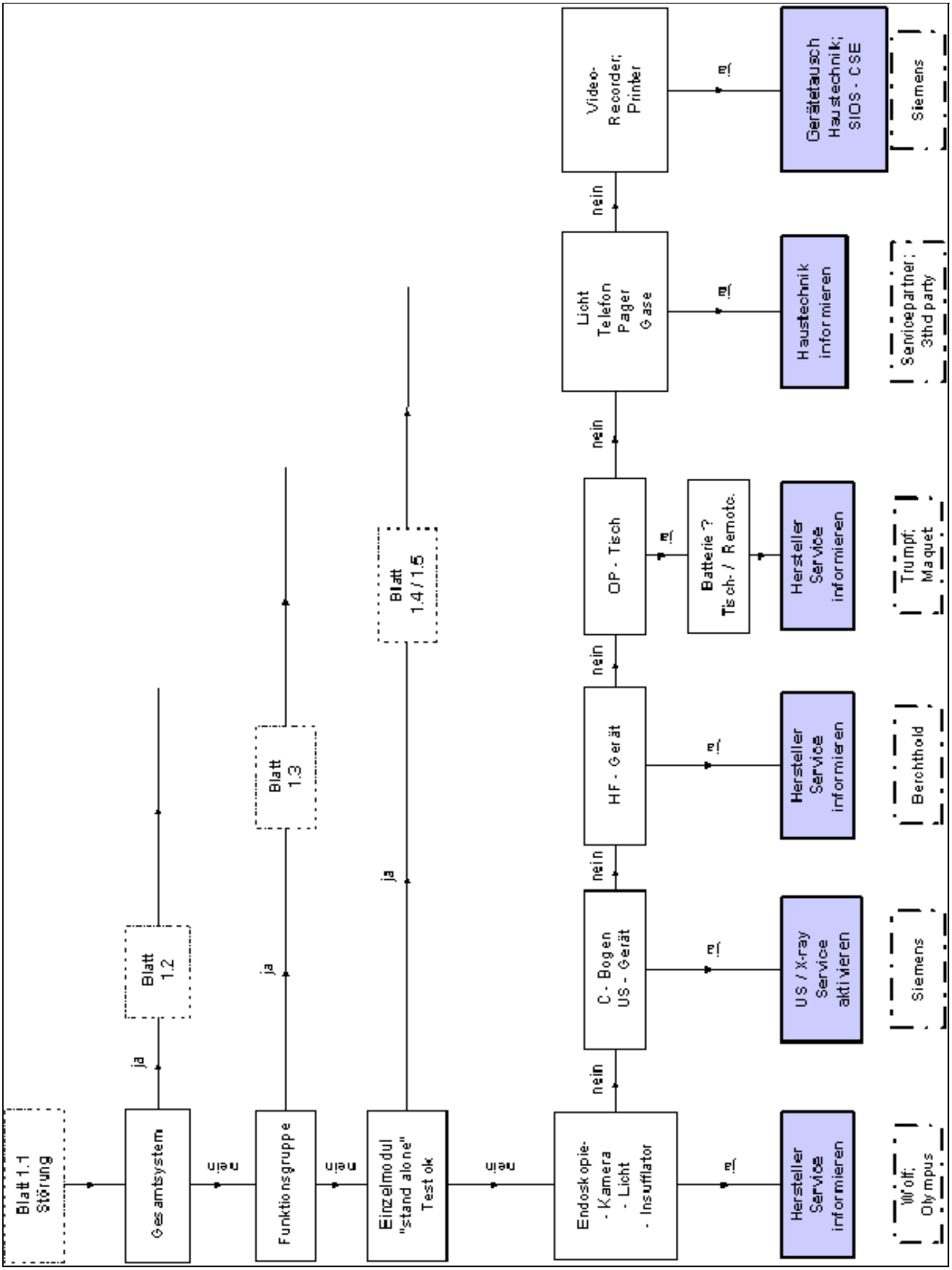

Fig. 1 Interface clarification

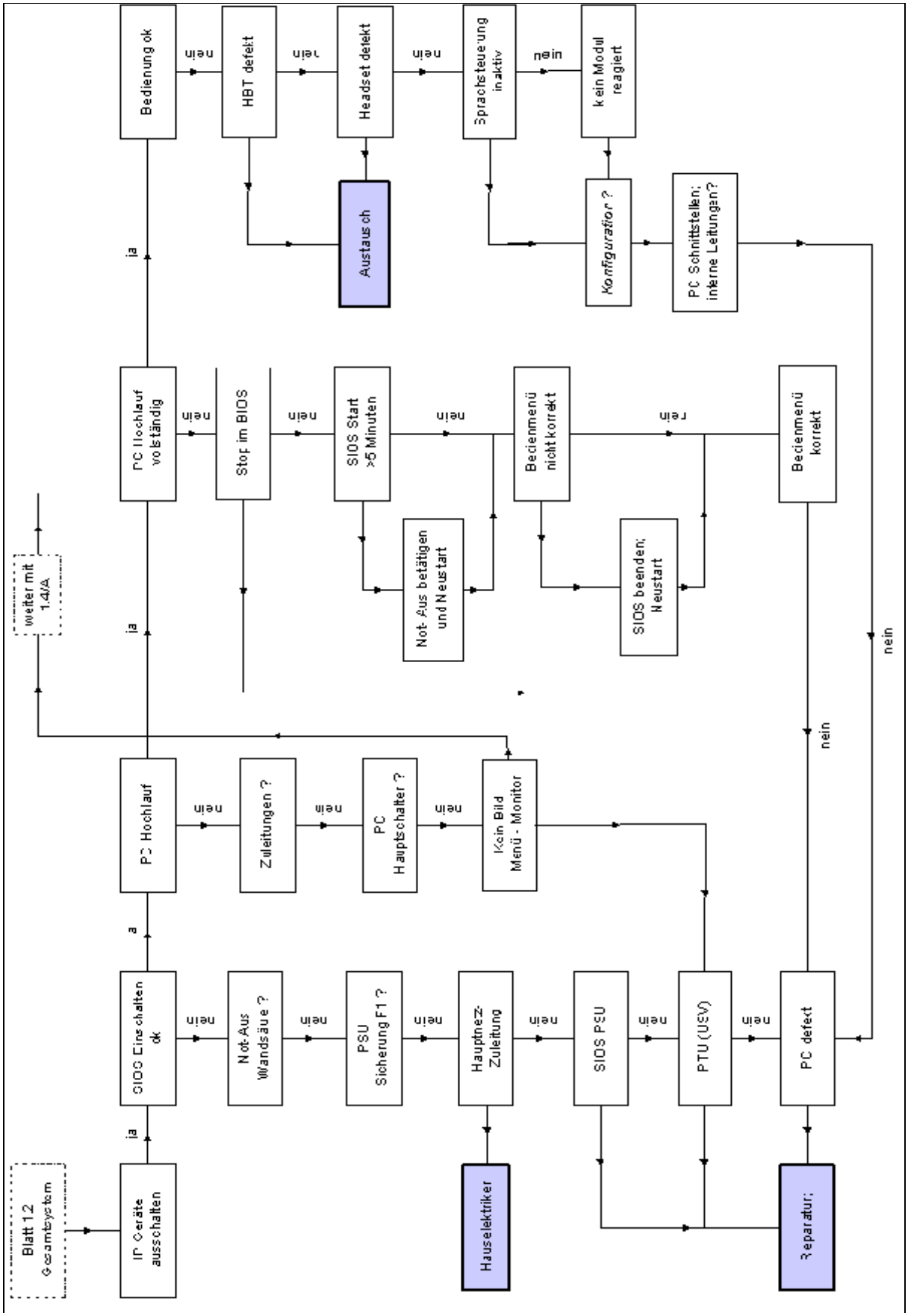

Fig. 2 Problem in complete system

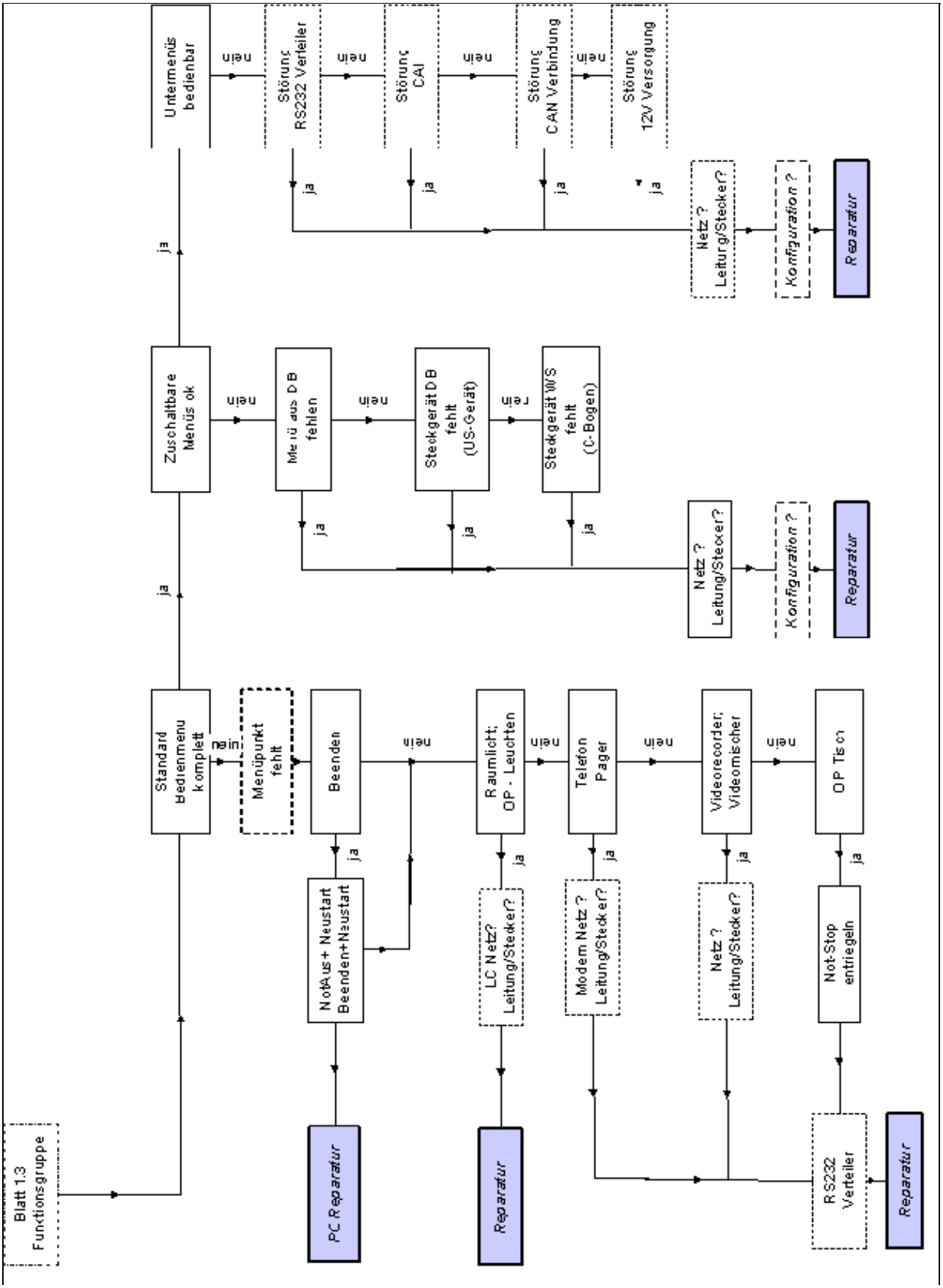

Fig. 3 Problem in function group

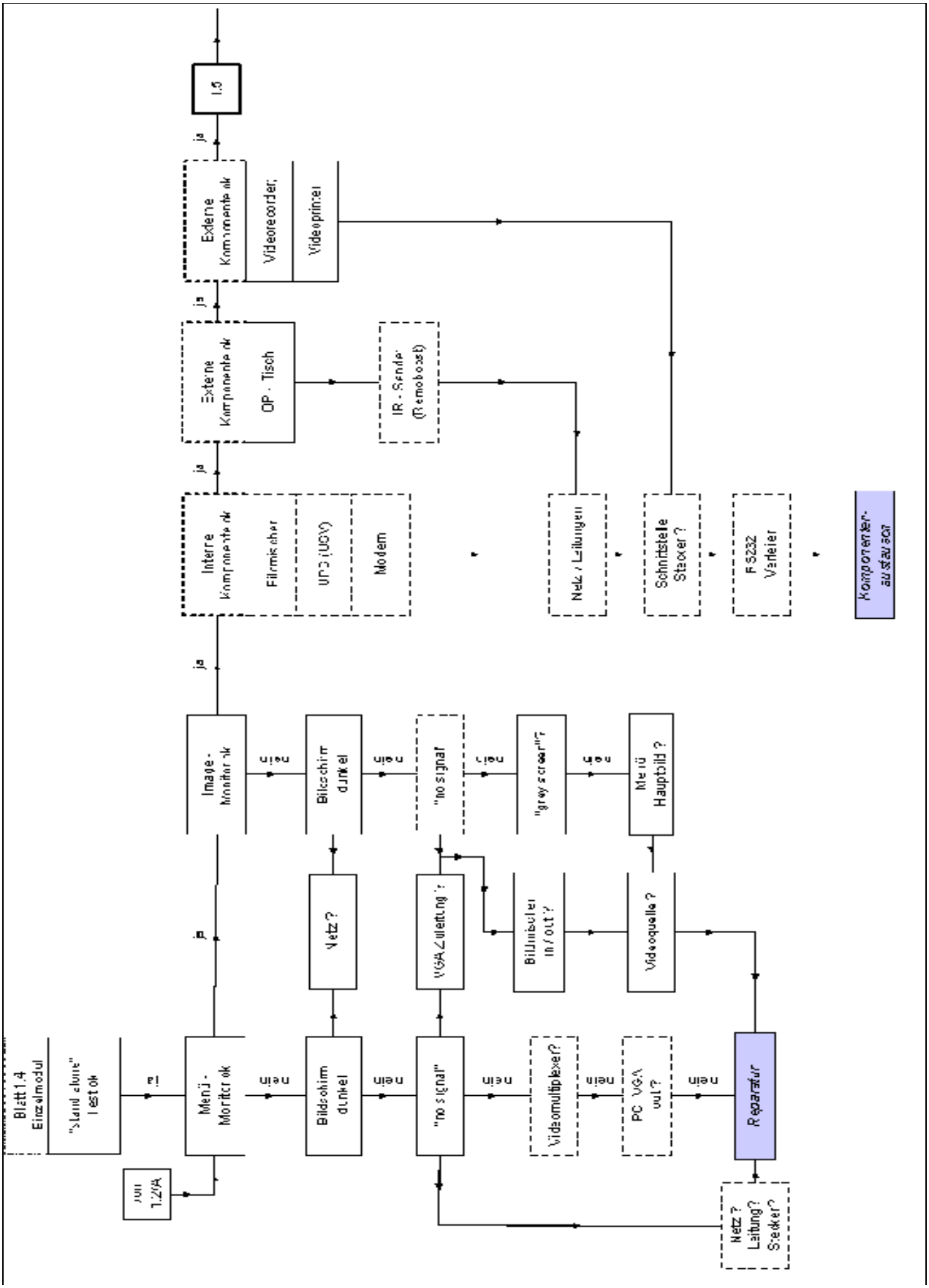

Fig. 4 Problem in component

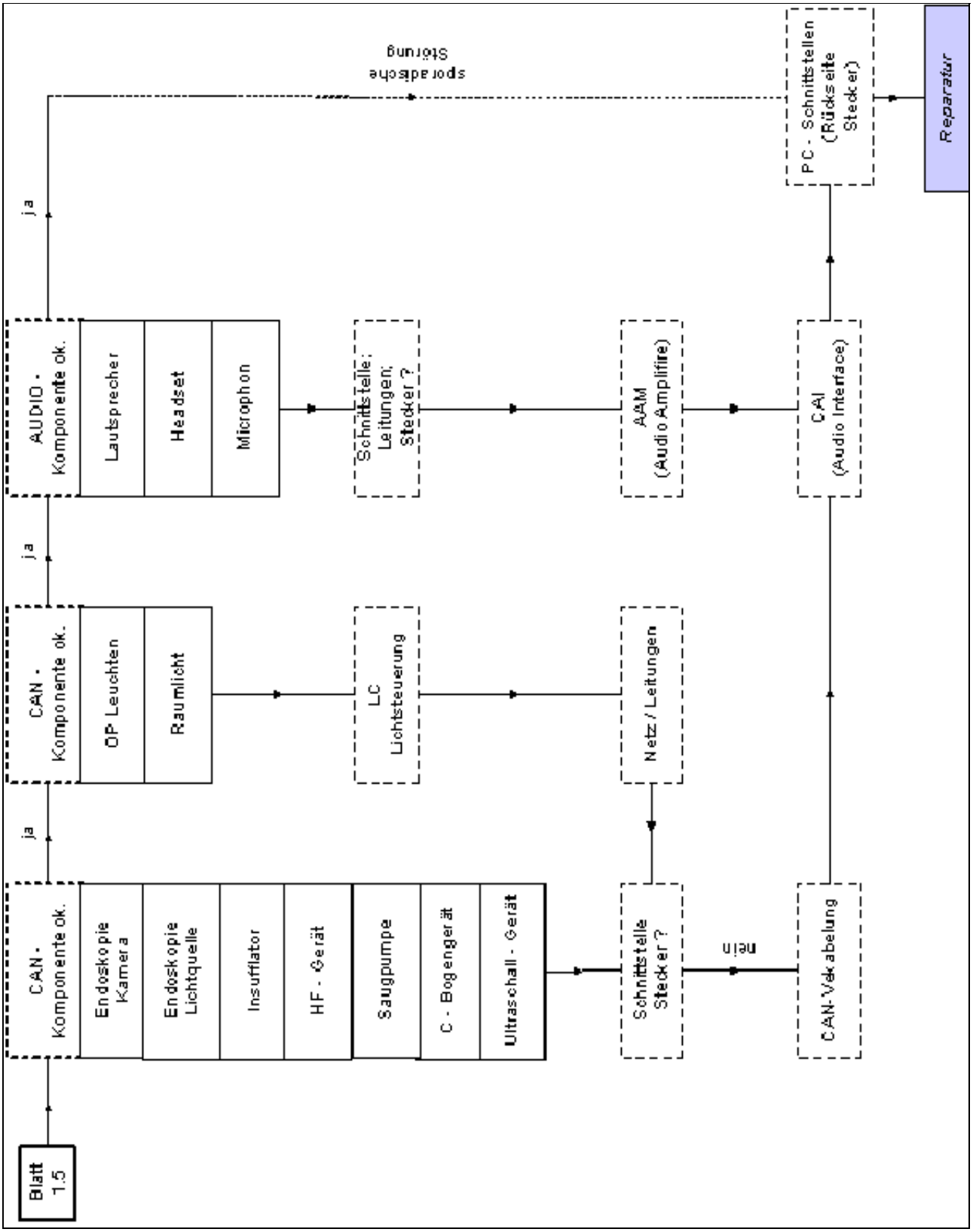

Fig. 5 Problem in component

Data Security

Trace log files can be used to identify errors that occur sporadically. ClearKey must be deactivated in order to read or transfer log files.

When ClearKey is deactivated, all work is subject to data security regulations.

Data Back-Up

Data may be coped to a separate ZIP diskette to simplify start-up, maintenance, and/or service.

NOTICE: All copies should be used only once during necessary procedures, and deleted immediately thereafter.

Excerpts that reference protected patient, customer, or system data are not permitted.

Unauthorized distribution of copies to third parties is not permitted.

Data required as a resource at other locations must be protected against third-party access.

Diskette Security

ZIP diskettes that are not kept locked away on-site must be read and write protected.

Data Transfer

If multiple systems are started up in a connected OR area, the first SIOS is used as the "Master." The basic configuration of the first backup disk is copied to a separate ZIP disk and used for the other systems.

This includes pager selection, pager list, telephone selection, telephone list, mobile OR tables, speaker data etc.

Individual parameters for each room must be maintained on the corresponding diskette.

One complete backup disk each has to be created per system according to the serial number and stored in the electronics cabinet of the respective system.

Reading Log Files

Trace log files can be used to identify errors that occur sporadically.

ClearKey must be deactivated in order to read or transfer log files.

Access to and transfer of log files must be coordinated with the USC.

Deactivating ClearKey

NOTICE: This function must be reactivated before the system is made available to the customer.

- In the "Settings/Service" menu, select Service and enter Password 1.
- Select the System Parts task card.
- Select the Security Page and enter Password 2.
- Deactivate "Set/Clear Key Intercept Flag" (delete the check mark from the checkbox).
- Close the security window by clicking the "Close" field.
- Click "Apply" in the "System Parts" window.
- Close all task cards and return to the SIOS main menu.

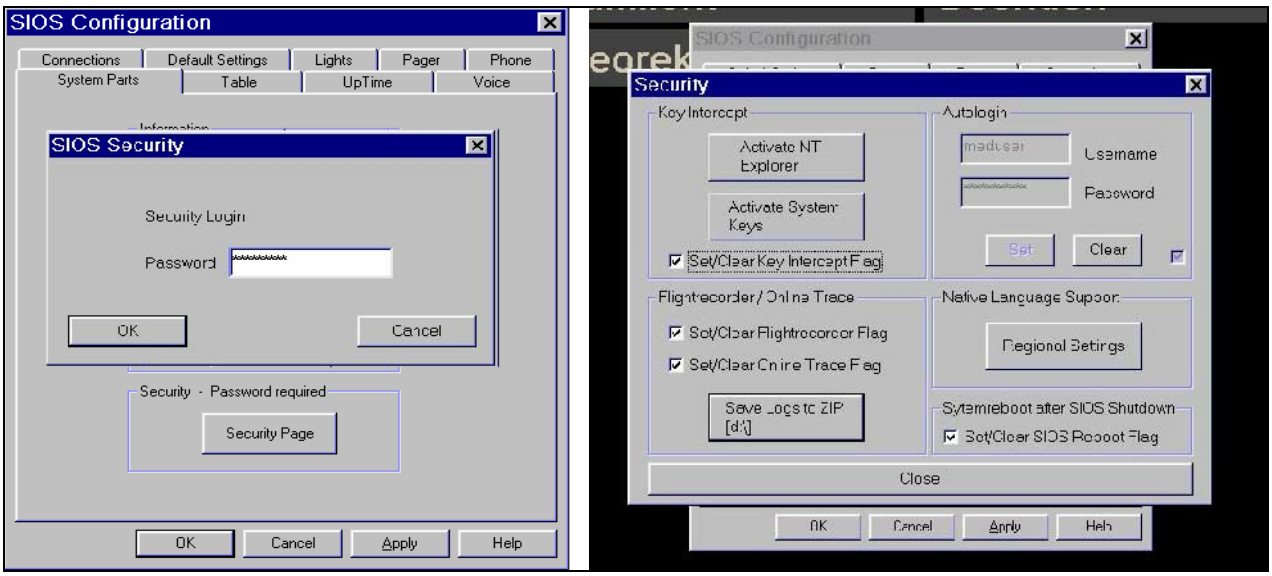

Fig. 1 Activating ClearKey

- Select the "Exit" menu and restart the system by selecting "Exit SIOS" "Restart".

During this process, do not switch on or off any components with an interface to SIOS. In addition, do not operate any system.

Selecting Trace.log

Online Trace

- Open Windows Explorer with key combination "Ctrl" + "Esc".
- Path in Explorer C:MedSp\log\SIOS_trc_XXXX.log (XXXX = Month_Day)

File transfer:

- Insert a diskette in the ZIP drive.
- Create a new folder on the ZIP diskette.
- Check the log files for storage capacity (max. 250 MB).
- Copy the required log files to the new folder on the ZIP diskette.

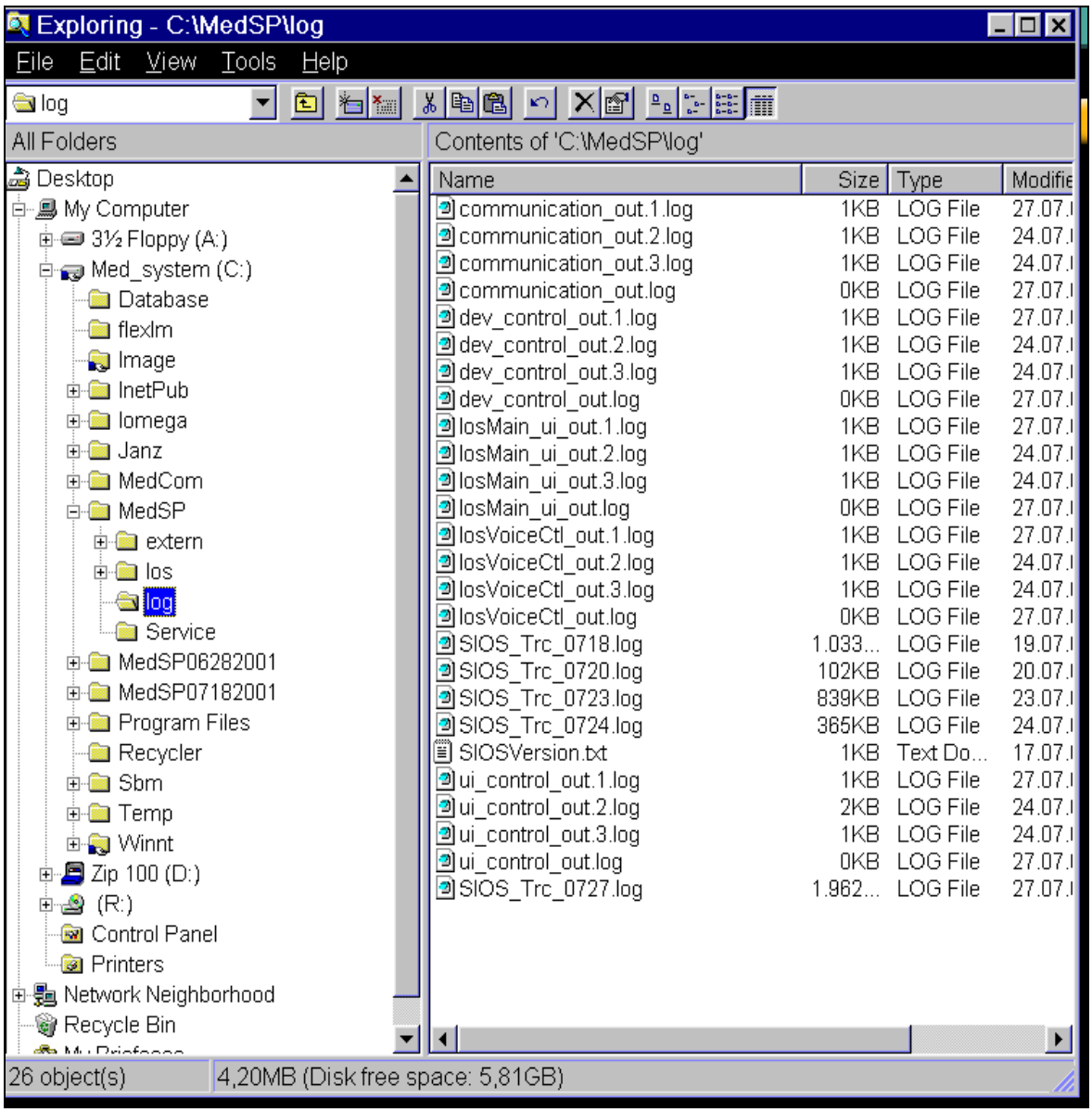

Fig. 2 Trace Log Files

Viewing Trace.log

Log files from previous days may only be opened in WordPad.

The current Trace.log may be opened by selecting key combination "Alt" + "Tab" and switching to "TraceWnd".

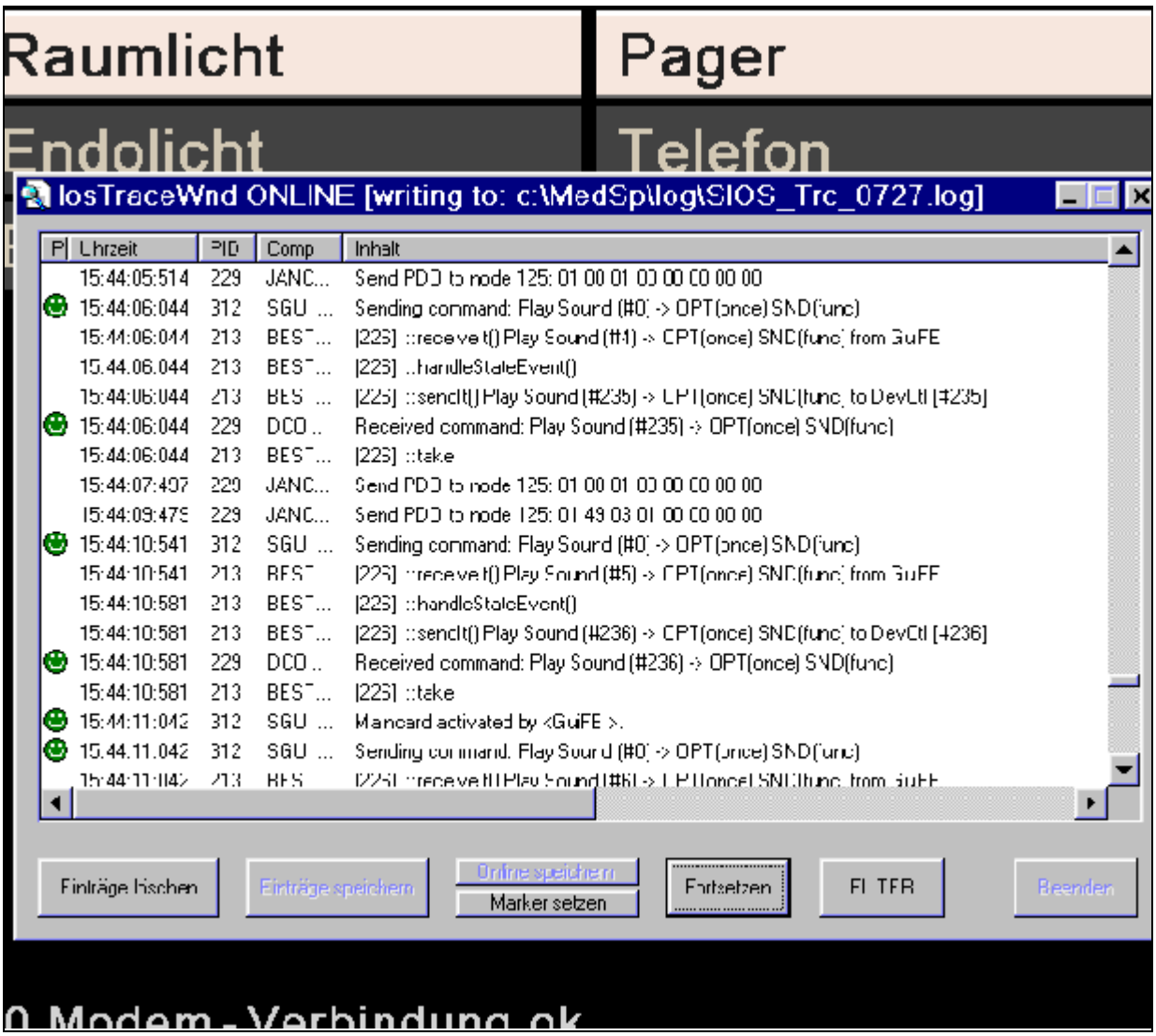
Raumlicht
Pager
Endolicht
Telefon
losTraceWnd ONLINE [writing to: c:\MedSp\log\SIOS_Trc_0727.log]
P| Uhrzeit PID Comp Inhalt
15:44:05:514 229 JANC... Send PDO to node 125: 01 00 01 00 00 C0 00 00
15:44:06:044 312 SGU ... Sending command: Play Sound (#0) -> OPT(once) SND(func)
15:44:06:044 213 BES... |223| ::receive() Play Sound (#1) -> OPT(once) SND(func) from GuiFE
15:44:06:044 213 BES... |223| ..handleStateEvent()
15:44:06:044 213 BES... |223| ::sendIt() Play Sound (#235) -> OPT(once) SND(func) to DevCtl (#235)
15:44:06:044 229 DCO .. Received command: Play Sound (#235) -> OPT(once) SND(func)
15:44:06:044 213 BES... |223| ::take
15:44:07:407 229 JANC... Send PDO to node 125: 01 00 01 00 00 C0 00 00
15:44:09:479 229 JANC... Send PDO to node 125: 01 49 03 01 00 C0 00 00
15:44:10:541 312 SGU ... Sending command: Play Sound (#0) -> OPT(once) SND(func)
15:44:10:541 213 BES... |223| ::receive() Play Sound (#5) -> OPT(once) SND(func) from GuiFE
15:44:10:581 213 BES... |223| ::handleStateEvent()
15:44:10:581 213 BES... |223| ::sendIt() Play Sound (#236) -> OPT(once) SND(func) to DevCtl (#236)
15:44:10:581 229 DCO .. Received command: Play Sound (#236) -> OPT(once) SND(func)
15:44:10:581 213 BES... |223| ::take
15:44:11:042 312 SGU ... Mancard activated by <GuiFE >.
15:44:11:042 312 SGU ... Sending command: Play Sound (#0) -> OPT(once) SND(func)
Einträge löschen
Einträge speichern
Online speichern
Marker setzen
Fortsetzen
FI TFR
Beenden
0 Modem - Verbindung ok

Fig. 3 Current trace

Click "Pause", and review the history in the Trace window using the right scroll bar.

Lines without a leading symbol indicate work steps within an action.

Leading symbols:

"Smiley, green" = action completed correctly.

"No smile, yellow" = warning, action could not be completed correctly.

"Angry face, red" = error, action could not be performed.

Interpreting the Trace information is not the task of the service technician.

The information will be provided only as part of technical clarification with the USC/HSC.

Updating the Backup

Once all system configuration changes have been completed, back up the data to the System Backup Diskette. The backup diskette is located in the lockable lower section of the electronics cabinet (inside the door).

The following are saved:

- All ccf files (entire user interface)
- Part of the "registry" (individual configurations)
- Hardware configuration
- Speaker data
- System options

Prerequisites:

- "ClearKey" has been deactivated in the Service Menu.
- The Backup diskette has been inserted in the external ZIP drive

Saving Control Menus (ccf files)

Press "Ctrl" + "Esc" to open the "Explorer" menu.

- Select drive C: MedSp\Ios\Data\ ccf
- In the command line: "edit" / "copy" (copy ccf Folder)

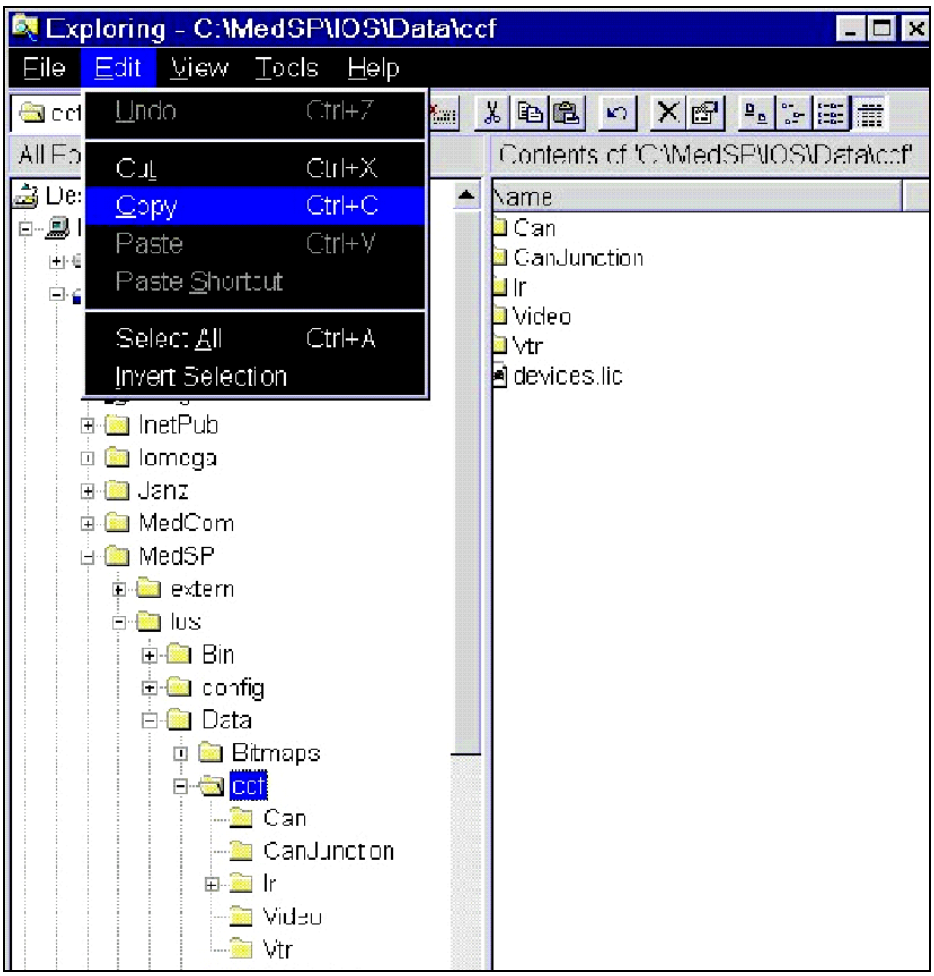

Fig. 1 Copy ccf

- Select external drive folder "SIOS_100X\Konfig_01"
- Select "edit" "paste" to copy the "ccf" folder to the diskette.
- Select "edit" "paste" to copy the "ccf" folder to "Updates\Backup".

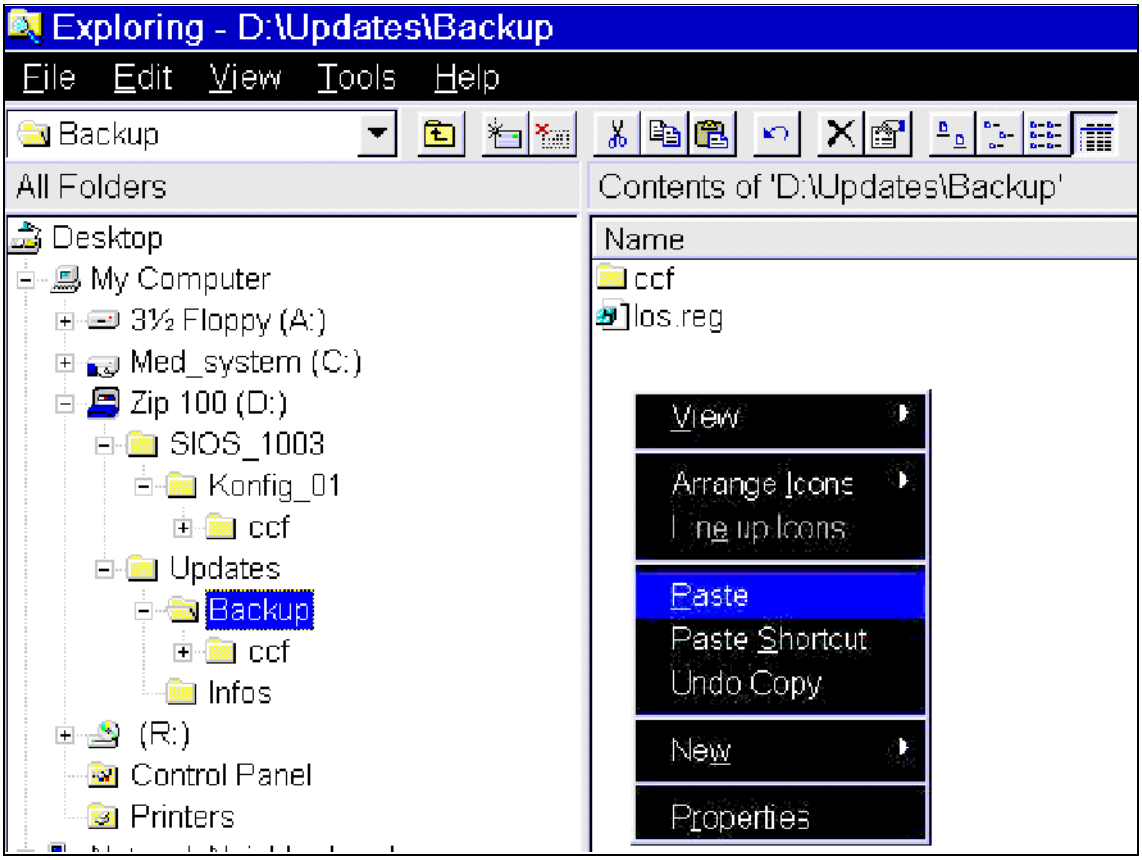

Fig. 2 Paste ccf

Saving the Software Configuration (registry)

Step 1:

- Press "Ctrl + Esc" to open the "Start" menu.
- Select "Run", enter "regedit", and click "OK".

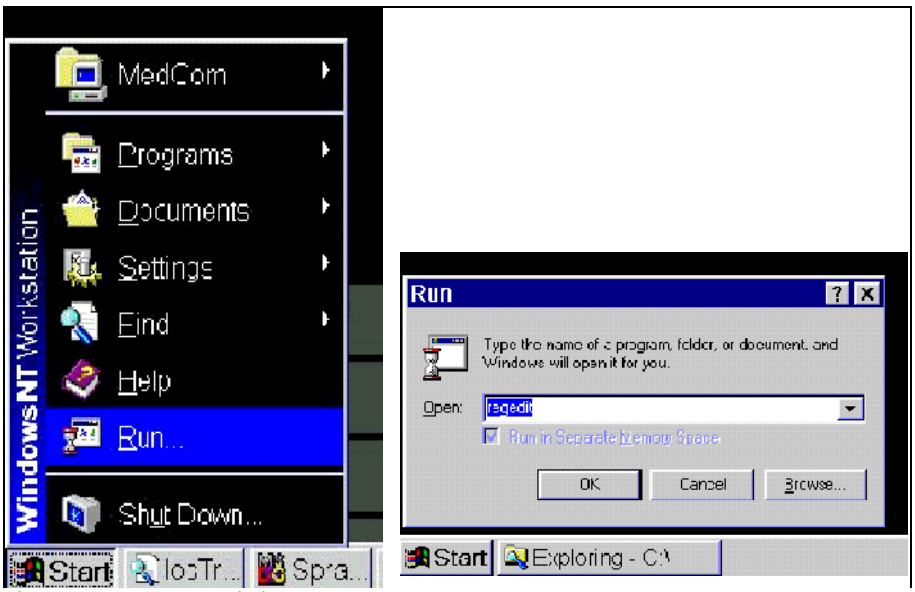

Fig. 3 start run & run window open

Step 2:

- Select "HKEY_LOCAL_MACHINE\SOFTWARE\Siemens\IOS".
- In the command line select "Registry" "ExportRegistryFile".

NOTICE: "Selected branch" has to be selected in this window.

- Export folder "SIOS_Ser.Nr.\Konfig_01" to "ZIP drive".
- Export folder "Updates\Backup" to "ZIP drive".

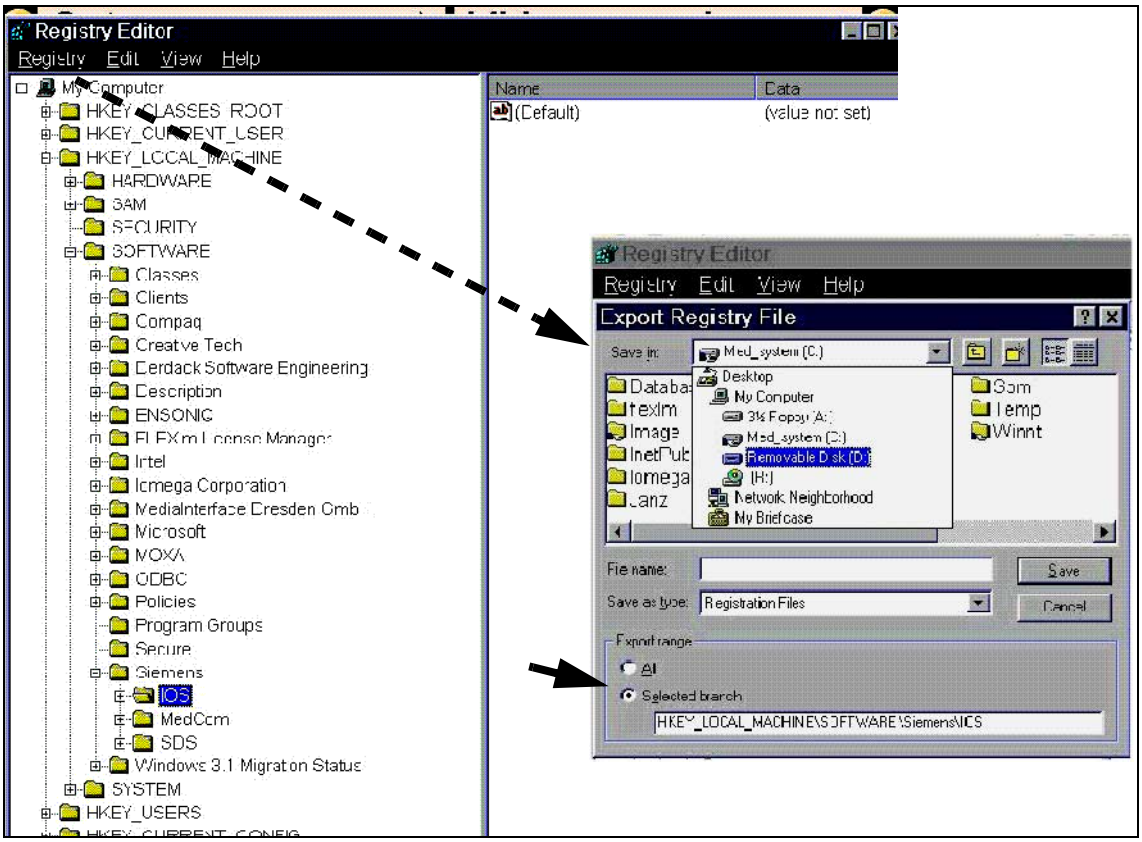

Fig. 4 HKEY_LOCAL_MACHINE\SOFTWARE\Siemens\IOS - export to disk

Backing Up the Speaker Data

- Open Explorer.
- Select path: C:\SBM\SDSData\hs_user
- Copy the folder by selecting "Copy".
- Paste the folder to ZIP: \ SIOS_SerNr\Konfig_01 on the Backup Diskette.
- Save a second copy under ZIP: \Updates\Backup.

Backing Up the Hardware Configuration

If parts with serial numbers are replaced, the new parts must be added to the hardware configuration.

- Open Explorer and open external drive:
  "D:Updates/Backup /Hardware_Konfig.txt" .
- Copy the text lines for the original component.
- Paste these lines under "Component Replacement".
- Overwrite the component data in this line with the data from the label (serial no., etc.).

The following data, if known, should also be included when upgrading or changing IP devices:

- Industry partner systems incl. manufacturer, type, and serial number
- Interface connection

- Save the file with all changes to the backup diskette.
- Select "save as" to save this file under path **"C:MedSP\Service\Konfig"** and name the file **"Hardware_Konfig_live.txt"** .
- If the file already exists, the earlier version will be overwritten.

Restore

Restore can be performed for:

1. All ccf files (user interface)
2. Part of the "Registry" (configuration)
3. Speaker data

Prerequisites:

- "ClearKey" is deactivated in the Service Menu.
- The backup diskette with the corresponding serial number is in the external ZIP drive.

Restoring the User Interface (ccf Files)

In the Explorer, check the ZIP drive to ensure the diskette is up-to-date.

- In the command line, enter "View" "Detail".
- Contents (right side) under "Modified" = date the data was last saved.
- Select folder "Updates\Backup\ccf" and copy it with "Copy".
- Switch to C: MedSp\los\Data " and "Paste" the folder.
- Confirm the query "Confirm Folder Replace" with "Yes".

Restoring the Configuration (Registry)

In the Explorer, check the ZIP drive to ensure the diskette is up-to-date.

- In the command line, enter "View" "Detail".
- Contents (right side) under "Modified" = date the data was last saved.
- Select folder "Updates\Backup".
- With the left mouse button, double click the "los.reg" file.
- Entries are made to the system registry automatically, and are confirmed by a corresponding window. Close the window by clicking "OK".

NOTICE: The Restore becomes active after the SIOS PC is restarted.

Once the Restore has been successfully completed, the "ClearKey" function must be reactivated and the backup diskette must be removed from the drive.

Restoring Speaker Data

- Select path ZIP **"D: \Updates\Backup\hs_user"**
- Copy the folder by selecting "Copy".
- Paste the folder under " **C:\SBM\SDSData\hs_user**" and overwrite the existing folder.

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Service Information

Files containing technical information important for the SIOS system are located on the backup diskette in the "Updates\Infos" folder.

For example, configuring the pager prefixes is very time-consuming. Once programming is complete, a "screen shot" may be stored.

If special features need to be taken into account in conjunction with individual systems, a "notepad" file should be stored containing this information.

Screen Shot

Prerequisites:

- "ClearKey" must be deactivated in the Service Menu.
- The backup diskette must be inserted in the external ZIP drive

Actions:

- Press "Ctrl" + "Esc" to open the "Start" window.
- Start the "Paint" program by selecting "Programs" "Accessories".
- Click the "-" symbol (Minimize) to move the "Paint" program to the background.

Fig. 1 Paint Program

- Select the image content to be stored at the control monitor:

e.g., basic pager settings

- Select "Settings/Service/Activate service" to display the Pager task card on the menu monitor.
- Press key combination "Ctrl / Prt Sc" to store the entire menu monitor image on the PC clipboard.
- Press key combination "Ctrl /Alt/ Prt Sc" to only store the image of the active task card on the PC clipboard.

- Notice: The mouse pointer is not stored in the image.
- Press key combination "Alt" / "Tab" to switch to the Paint program.
- Press key combination "Ctrl" / "V" to paste the image content from the clipboard to Paint.
- Use the mouse to select "File" "SaveAs".
- Select path "ZIP-Drive\Updates\Infos".
- Enter a logical name based on the content; e.g.: "Pagerkonfig.bmp"
- Click "Save" in the "SaveAs" window.

Pager and telephone lists can be stored in this manner and subsequently displayed as needed.

Service Notice - "Notepad File"

Prerequisites:

- "ClearKey" must be deactivated in the Service Menu.
- The backup diskette must be inserted in the external ZIP drive

Actions:

- Open the Start window with "Ctrl" + "Esc".
- Start the "WordPad" program by selecting "Programs" "Accessories".

Create the notice. The text should clearly and succinctly provide information by answering the classic 5 Ws.

Example:

Text

Where? SIOS Ser.Nr. 1001; Room 1, Sample Hospital

What? An additional interface with 4kV isolation is connected at the image mixer.

Why? The image is transferred from the image monitor to the head physician's office.

When? Start-up on 2/31/2001.

How? The technical documentation is stored in the system binder, which is kept by in-house technician Mr. Smith, tel.: 4711 0815.

Who? Initiated by name / company / department

signed,

Henry Jones

- Use the mouse to select "File" "SaveAs".
- Select path "ZIP-Drive\Updates\Infos".
- Enter a logical name based on the content; e.g.: Video_option.txt.
- Click "Save" in the "SaveAs" window.

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ClearKey

This function must be reactivated before the system is made available to the customer.

- Select "Activate Service" under "Settings/Service", and enter Password 1.
- Select the "System Parts" task card.
- Select the "Security Page" and enter Password 2.
- Activate "Set/Clear Key Intercept Flag" (mark the checkbox).
- Close the security window by clicking the "Close" field.
- Click "Apply" in the "System Parts" window.
- Close all task cards and return to the SIOS main menu.

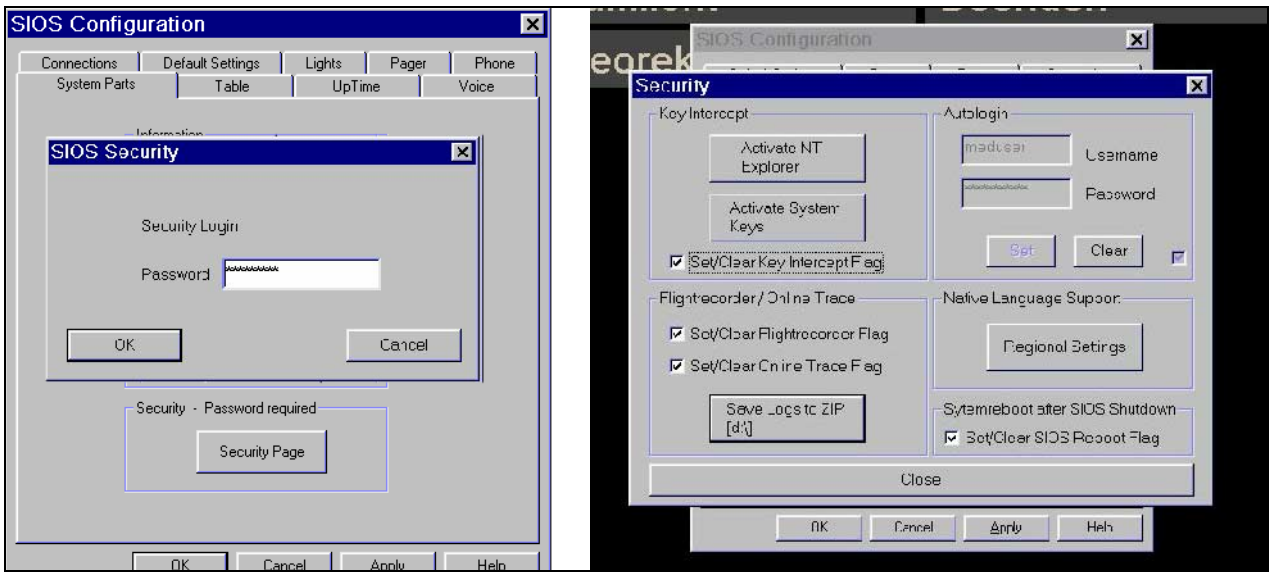

Fig. 1 Activating ClearKey

- Select the "Exit" menu and restart the system by selecting "Exit SIOS" "Restart".

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Service Activities on Hardware

SIOS repairs are limited to "black box" replacement. All functional components are included in the spare parts list. Refer to the installation and start-up instructions to replace the components.

Record the new data when replacing a component. Update the "Hardware_Konfig.txt" file on the backup diskette.

Test the protective conductor if covers or fixed cable connections have been removed.

SIOS PC Replacement

The complete PC with both hardware and software is delivered as a refurbished spare part. The current basic version of the SIOS software is installed on each PC.

- Connect the PC (refer to System Overview - PC Connections)
- Perform a complete SIOS start up.
- Perform a Restore.
- Update the backup diskette.

Protective Conductor Measurement

Perform a protective conductor resistance measurement in accordance with ARTD Part 2. Use the following measurement points and compare to the central point in the electronics cabinet:

- Sliding shelf in upper section of electronics cabinet
- External covers of electronics cabinet and doors of lower section
- External covers of device box and adjustable shelves of surgical devices
- Support arm cover screws up to 2 m above the floor
- MTS cover screws and monitor housing

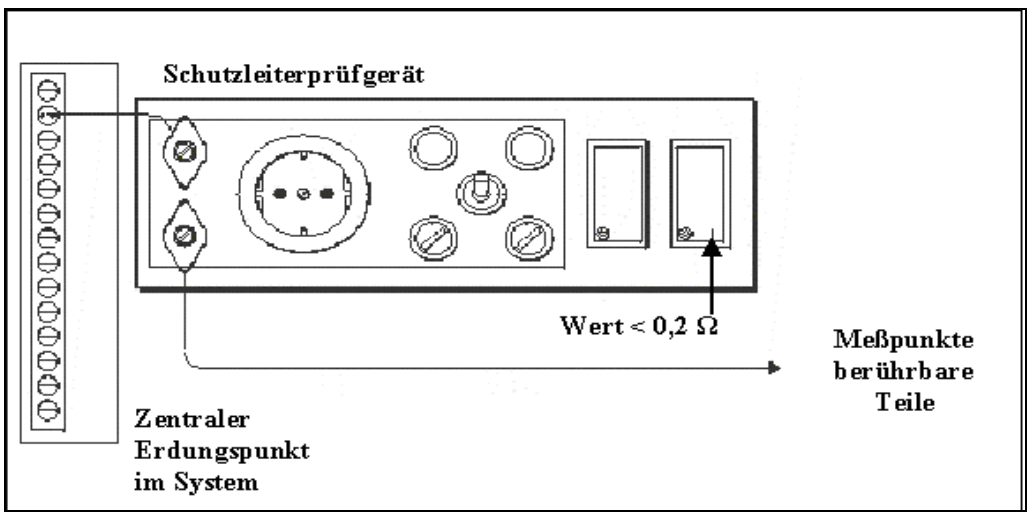

Fig. 1 Protective conductor meter

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